SOIL SURVEY OF

Fayette County, Pennsylvania

United States Department of Agriculture
Soil Conservation Service
In cooperation with
The Pennsylvania State University
Agricultural Experiment Station and
Agricultural Extension Service
The Pennsylvania Department of Agriculture
State Soil and Water Conservation Commission

Major fieldwork for this soil survey was done in the period 1957–67. Soil names and descriptions were approved in 1968. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1968. This survey was made cooperatively by the Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission. It is part of the technical assistance furnished to the Fayette County Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Fayette County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the capability unit in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units.

Foresters and others can refer to the section "Use of Soils as Woodland," where the soils of the county are rated according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Community planners and others concerned with town and country planning can read about soil properties that affect the choice of sites for homes, nonindustrial buildings, schools, and recreation areas in the sections "Town and Country Planning" and "Use of Soils for Recreation."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Fayette County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication and in the section "General Nature of the County."

***Cover picture.*—Landscape in the Guernsey-Westmoreland-Clarksburg soil association.**

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SOIL SURVEY OF FAYETTE COUNTY, PENNSYLVANIA

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE PENNSYLVANIA STATE UNIVERSITY, AGRICULTURAL EXPERIMENT STATION AND AGRICULTURAL EXTENSION SERVICE, AND THE PENNSYLVANIA DEPARTMENT OF AGRICULTURE, STATE SOIL AND WATER CONSERVATION COMMISSION

FAYETTE COUNTY is in the southwestern part of Pennsylvania. The center of the county is about 45 miles south and a little east of Pittsburgh (fig. 1). The southern boundary of the county is the Mason and Dixon Line, which borders West Virginia and Maryland. The entire western boundary of the county is the Monongahela River. The county has an area of 794 square miles, or 508,160 acres.

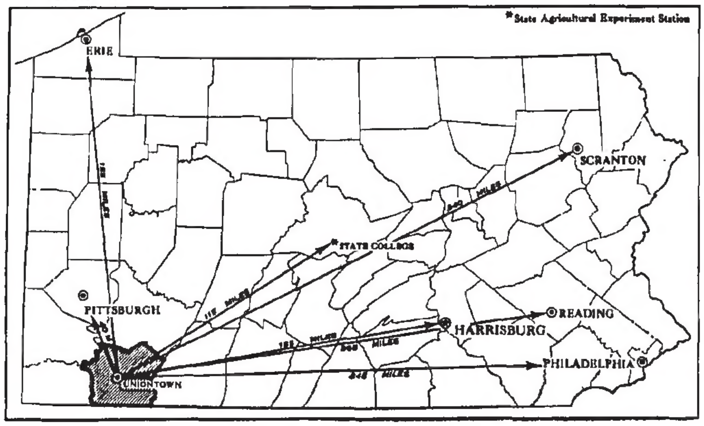

Figure 1.—**Location of Fayette County in Pennsylvania.**

The eastern part of Fayette County is mountainous; Chestnut Ridge rises to heights of more than 2,900 feet. This area is sparsely populated and is physiographically different from the western half of the county. It is readily accessible to the Pittsburgh metropolitan area. The area west of Chestnut Ridge is a rolling and hilly plateau. Much of this area was underlaid with the Pittsburgh seam of coal, but most of this coal has been mined.

According to the 1960 census, the population of the county was 169,340. Municipalities within the county include two cities and 16 boroughs. In 1960, the city of Uniontown had a population of 17,942 and Connellsville had 12,814. The 16 boroughs had a population totaling 28,624.

All of Fayette County is in the Monongahela River watershed, which in turn is part of the Ohio and Mississippi River watersheds. Two of the principal tributaries of the Monongahela River, the Youghiogheny and Cheat Rivers, flow through Fayette County.

The county is served by a network of railroads and two-lane highways. The four-lane highways are U.S. Highway No. 119 from Uniontown to the Pennsylvania Turnpike and State Route 51 from Uniontown to Pittsburgh. One airport is located between Uniontown and Connellsville; it has charter service but no scheduled service. Educational, religious, and medical facilities are available.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Fayette County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey (*16*).[1]

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Hazleton and Wharton, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic

[1] Italic numbers in parentheses refer to Literature Cited, p. 106.

that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Wharton silt loam, 3 to 8 percent slopes, moderately eroded, is one of several phases within the Wharton series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Fayette County: soil complexes and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. An example is Clarksburg-Guernsey silt loams, 2 to 8 percent slopes.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Brinkerton and Armagh silt loams, 0 to 3 percent slopes, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Rubble land is a land type in Fayette County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Fayette County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The five soil associations in Fayette County are discussed in the following pages. The terms for texture used in the title for several of the associations apply to the surface layer. For example, in the title for association 1, the words "medium textured" refer to texture of the surface layer.

The Upshur-Albrights soil association on Chestnut Ridge is not shown on the general soil map in the published soil survey for Preston County, West Virginia. Similar reddish-colored soils were mapped on the ridge in West Virginia but were not extensive enough for a separate soil association in Preston County.

1. Gilpin-Wharton-Ernest association

Moderately deep and deep, well drained and moderately well drained, medium-textured, nearly level to very steep soils underlain by acid shale and some sandstone bedrock; on uplands

This association is widely distributed in the county. Smooth rounded hills and irregular or undulating slopes are common. Slopes are about 300 to 900 feet long. In the eastern part of the county, this association occupies much of the northern and southern areas between Chestnut Ridge and Laurel Hill. In the western part, it occupies a wide V-shaped area that extends from Point Marion to Perryopolis and from Point Marion to Laurelville.

This soil association makes up about 37 percent of the county. About 43 percent of this is Gilpin soils, 17 percent

is Wharton soils, 17 percent is Ernest soils, and the remaining 23 percent is minor soils.

The Gilpin soils are on the upper, generally smooth slopes (fig. 2). They are well drained and moderately deep.

The Wharton soils formed in place on ridgetops and benches. They are moderately well drained, are deep, and have a fine textured and moderately fine textured subsoil. Areas of both Wharton and Ernest soils are irregular and have numerous drainageways and seeps.

The Ernest soils generally are on the lower slopes. They formed in colluvium and have a fragipan.

Most of the other soils in this association are in the Weikert, Cavode, Philo, Brinkerton, and Armagh series. Areas of Strip mine spoil, acid, also occur.

This association has some of the better farming soils of the county (fig. 3). The area is adapted to pasture and general crops. Restricted drainage in the Wharton and Ernest soils impedes the movement of air and water within the soil.

The soils of this association have moderate to severe limitations to use as building sites. Springs and wells generally supply enough water for livestock and the household.

2. *Guernsey-Westmoreland-Clarksburg association*

Deep, well-drained to somewhat poorly drained, medium-textured and moderately fine textured, nearly level to moderately steep soils influenced by limestone strata in the bedrock; on uplands

This soil association consists of soils influenced by limestone and soils underlain by the Pittsburgh and other coal veins (fig. 4). The landscape consists of rounded hilltops and a series of benches located along the slopes (fig. 5). Elevation ranges from 900 to 1,300 feet. Slopes normally are from 300 to 900 feet long.

This association makes up about 27 percent of the county. About 41 percent of this is Guernsey soils, 25 percent is Westmoreland soils, 9 percent is Clarksburg soils, and the remaining 25 percent is minor soils.

The moderately well drained Guernsey soils have a moderately fine textured and fine textured subsoil and occupy all positions on slopes. The Westmoreland soils are well drained and occupy short, rounded hilltops and upper slopes. The Clarksburg soils are moderately well drained to somewhat poorly drained and occupy the bases of steeper

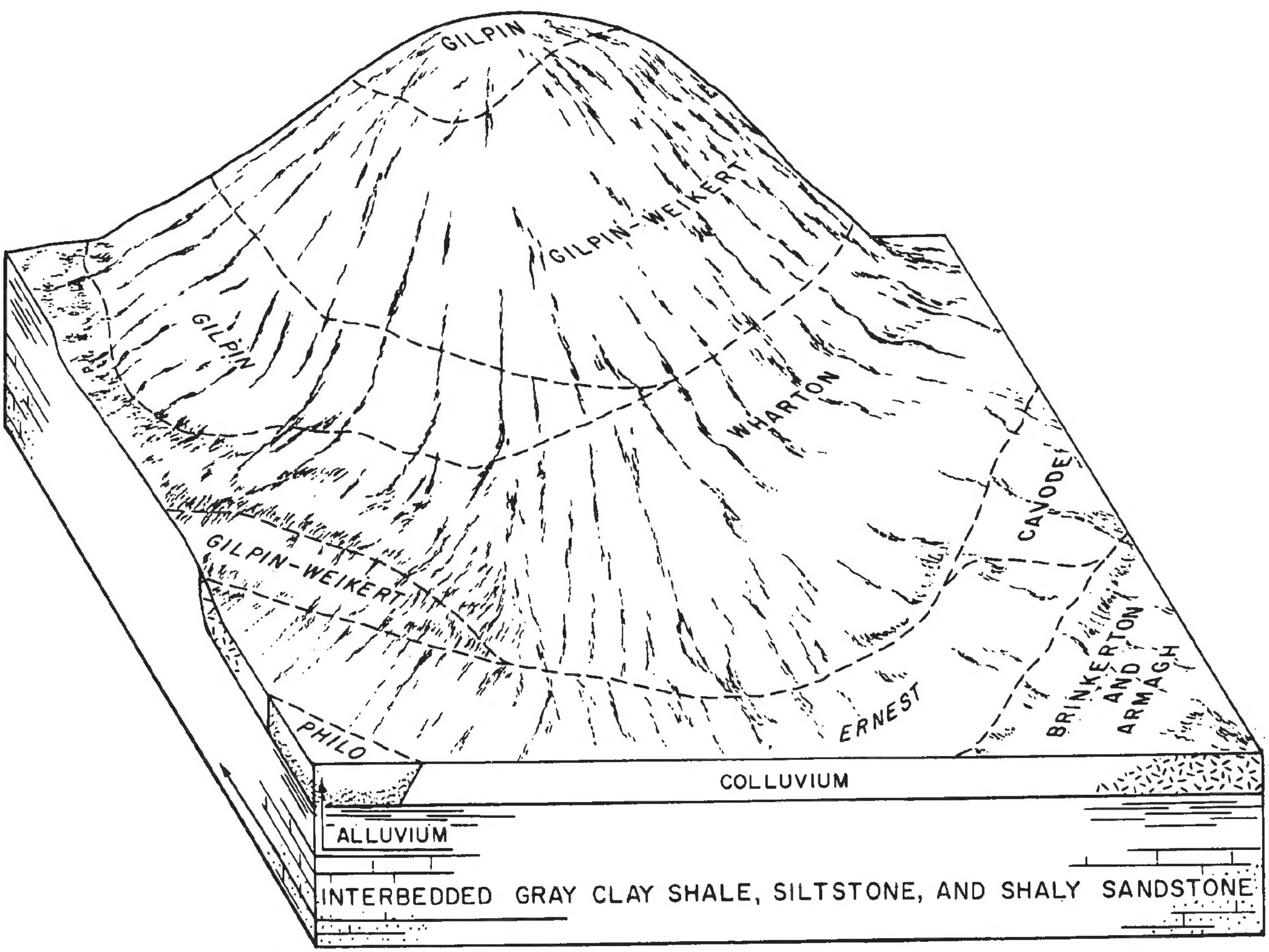

Figure 2.—Parent material, position, and pattern of soils in the Gilpin-Wharton-Ernest soil association.

Figure 3.—**Farming on soils of the Gilpin-Wharton-Ernest soil association. Crops in foreground and in contour strips are on Wharton soils. Farm pond is on Ernest soils. Hilltops in background are occupied by Gilpin soils.**

slopes. The Clarksburg soils have a fragipan. The minor soils are mostly Brooke, Lindside, Thorndale, Melvin, Newark, Gilpin, Weikert, and Library soils. Other areas are Strip mine spoil, nonacid, Mine dumps, and Urban land.

In this association are some of the better soils for farming in Fayette County. Dairy and general farming are dominant. The soils respond well to additions of lime and fertilizer, and natural fertility is moderate to high. The soils generally are rolling and surface drainage is good.

The use of this association is limited by the restricted permeability of the Guernsey and Clarksburg soils and by the unstable, moderately fine textured and fine textured subsoil of the Guernsey soils.

3. *Dekalb-Hazleton-Cookport association*

Moderately deep and deep, well drained and moderately well drained, moderately coarse textured and medium-textured, nearly level to very steep soils underlain by bedrock that is dominantly acid sandstone; on uplands

The soils of this association developed in residuum from acid rocks. They generally are located on and along Chestnut Ridge and Laurel Hill and along the Youghiogheny River. Most of this association is very stony.

This soil association makes up about 25 percent of the county. About 50 percent of this is Dekalb soils, 16 percent is Hazleton soils, 6 percent is Cookport soils, and the remaining 28 percent is minor soils.

The Dekalb soils are moderately deep and well drained. They are mostly very stony and very steep. Dekalb soils have low available moisture capacity and low natural fertility.

The Hazleton soils are deep and well drained. These nearly level to moderately steep soils are nonstony and have low to moderate available moisture capacity. The Cookport soils are deep and moderately well drained. They are nearly level to sloping and are mostly very stony.

The minor soils are in the Gilpin, Weikert, Clymer, Andover, and Buchanan series. Except for Clymer soils, all are steep, stony, or both. Rubble land is also in this association.

Most of this association is in trees, for which it is suited. The soils of this association are not good soils for farming. The main limitations to most uses are the restricted depth

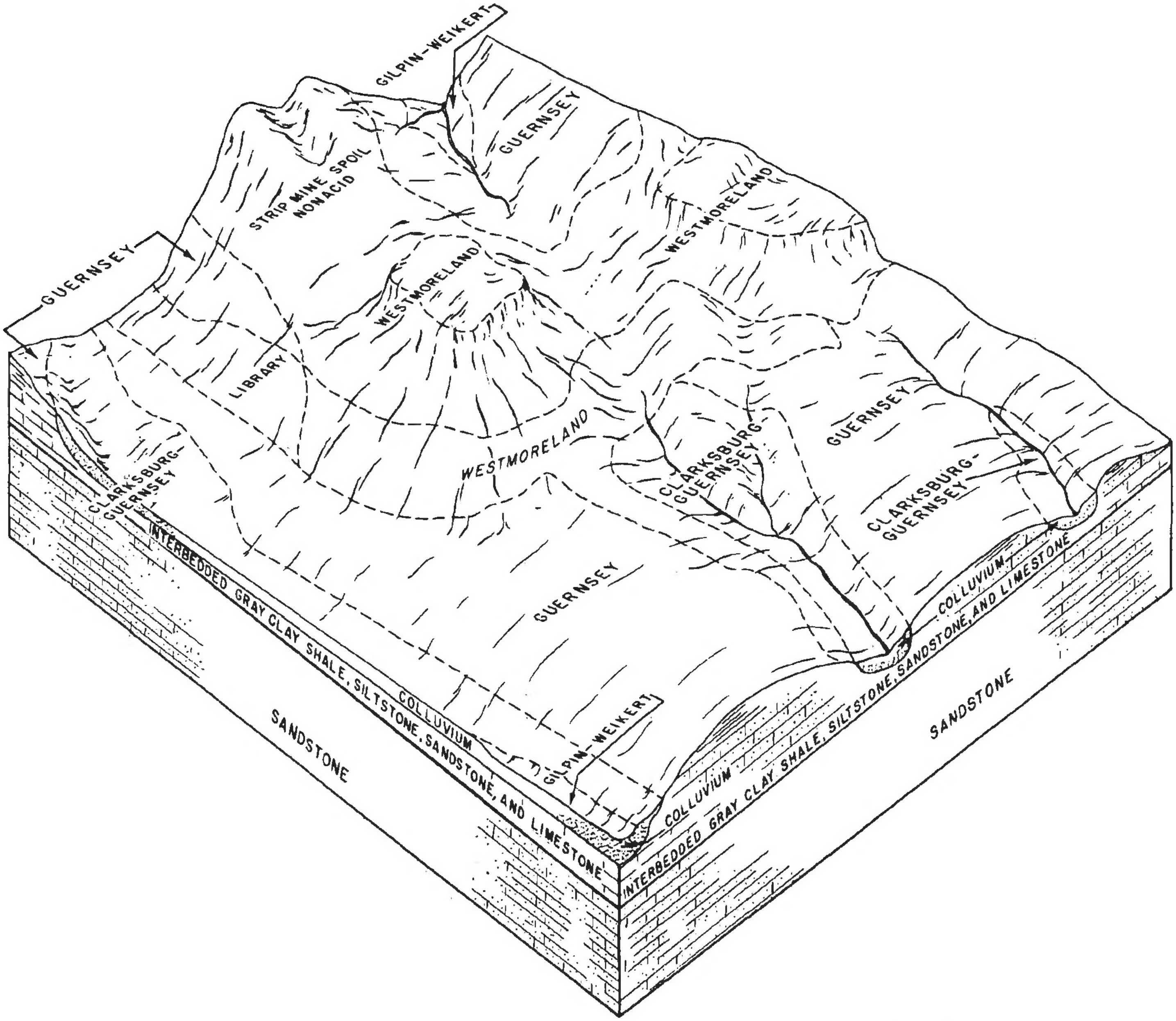

Figure 4.—**Parent material, position, and pattern of soils in the Guernsey-Westmoreland-Clarksburg soil association.**

to bedrock of Dekalb soils and seasonal wetness of Cookport soils.

4. *Upshur-Albrights association*

Deep, well-drained to somewhat poorly drained; gently sloping to very steep, reddish soils; on uplands

This soil association consists of soils formed in materials weathered from red shale, limestone, and some sandstone. It occurs along the upper slopes of the Chestnut Ridge and Laurel Hill. Slopes are 300 to 900 feet long. The association is easily recognized by the red color of the soils. Some of these soils are stony. Trees grow in most of the association. The few farms that occur are in scattered areas of the gently sloping and moderately sloping soils.

This association makes up about 7 percent of the county. About 65 percent of this is Upshur soils, 9 percent is Albrights soils, and the remaining 26 percent is minor soils.

The Upshur soils are deep and well drained. They formed in place from red shale and limestone and have a clayey subsoil. Slips and slides occur on the steeper Upshur soils. The Albrights soils are deep and moderately well drained to somewhat poorly drained. They have a fragipan and formed in material accumulated on mid and lower slopes.

The major soils of this association have moderate water holding capacity and natural fertility. They are normally nonacid. The minor soils are mostly the shallow, well-drained Weikert and moderately deep, well-drained Gil-

Figure 5.—A typical hilly area of the Guernsey-Westmoreland-Clarksburg soil association. Westmoreland soils are on the hilltops in background. Below them, and also in the foreground, are Guernsey soils. Clarksburg soils are on the lower valley slopes.

pin soils. They occur on valley sides and are steep. The minor soils are droughty and are best suited to trees.

The Upshur and Albrights soils are well suited to crops and trees. Black locust and yellow-poplar trees grow naturally on these soils. The principal soil limitations to use for farming are wetness and erosion. Beef cattle and general farming are the principal types of farming.

In this association a few large stone quarries produce road gravel. In many areas limitations to use for onsite sewage disposal are severe because of restricted permeability and seasonal wetness.

5. *Monongahela-Philo-Atkins association*

Deep, moderately well drained and poorly drained, medium-textured, nearly level to sloping soils on stream terraces and flood plains

The soils of this association have formed in deep alluvial deposits (fig. 6) and are commonly along the Monongahela and Youghiogheny Rivers. Steep valley sides or escarpments separate this association from other nearby associations.

This association makes up about 4 percent of the county. About 35 percent of this is Monongahela soils, 22 percent is Philo soils, 18 percent is Atkins soils, and the remaining 25 percent is minor soils.

The Monongahela soils are nearly level to sloping and occur on terraces. They are moderately well drained and have a fragipan in the subsoil. The Philo soils are nearly level, are moderately well drained, and occur on flood plains. The Atkins soils are nearly level, are poorly drained, and also occur on flood plains.

The minor soils are mostly in the Chavies, Allegheny, Tyler, Elkins, and Purdy series. These soils formed mostly in slack water and trace deposits. Also in the association on nearby uplands are Gilpin, Weikert, and Wharton soils.

The soils of this association have moderate to severe limitations as sites for most kinds of buildings. The low flood plains along the rivers and other streams are subject to flooding. A seasonal high water table restricts the downward movement of air and water through these soils. Farming is of little importance in this association because of flooding and wetness. Also, in many places these soils are in nonfarm uses.

Parts of this association have areas of the most community and industrial development in the county. But space for future building sites is limited because of the narrow area between the rivers and steep valley sides.

Use and Management of the Soils

The first part of this section explains how soils are grouped according to their capability and describes the capability units in Fayette County. The second part gives predicted ratings of productivity of the soils under two levels of management. Other parts describe the use of soils as woodland, discuss wildlife, explain engineering uses of soils, and discuss use of soils in town and country planning and for recreation.

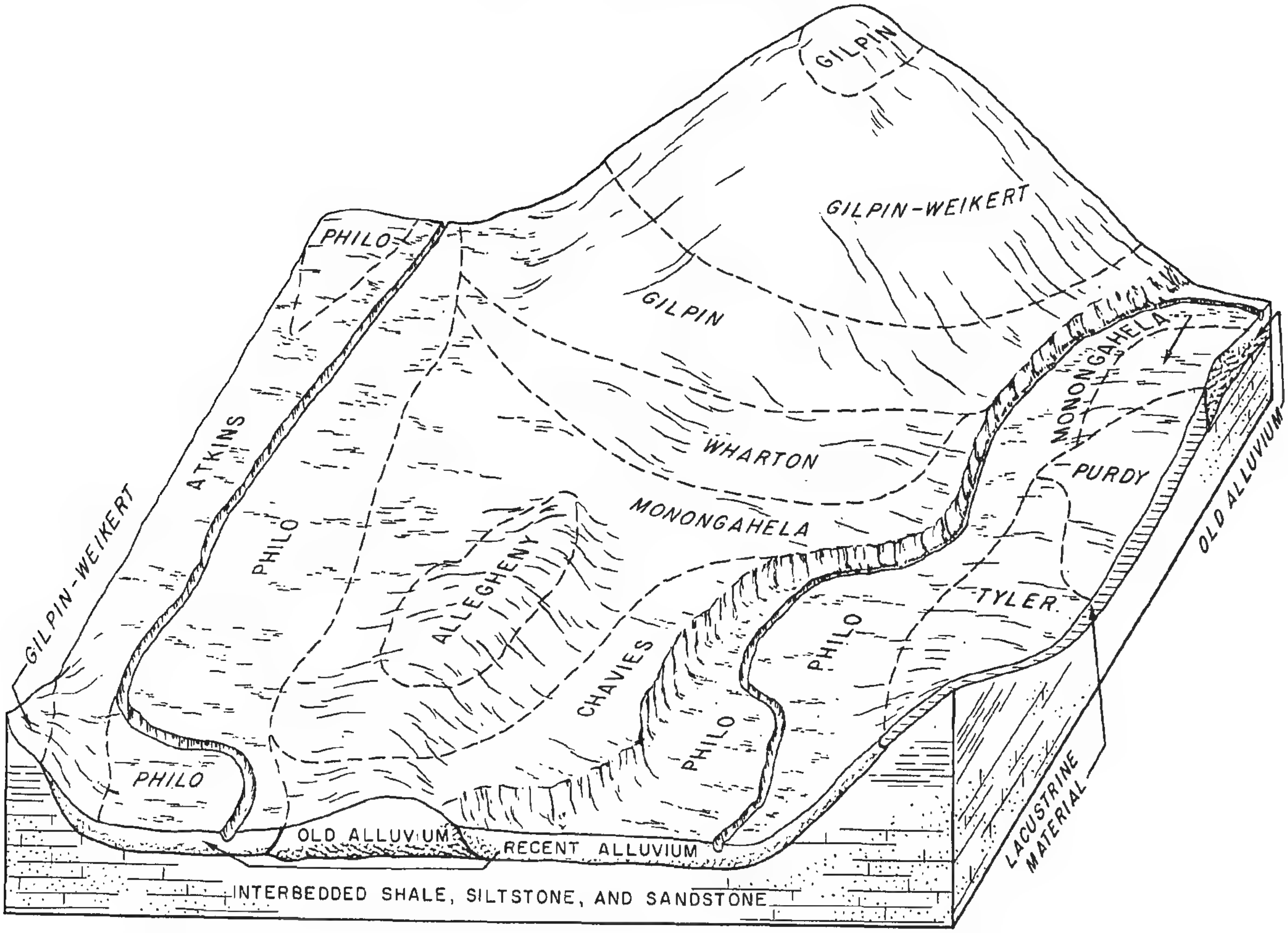

Figure 6.—Parent material, position, and pattern of soils in the Monongahela-Philo-Atkins soil association.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forest trees or engineering.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife. (None in Fayette County.)

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

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Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in some parts of the United States but not in Fayette County, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-3 or IIIe-1, Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraphs; and the Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

The soils in one capability unit have about the same limitations and are subject to similar risks of damage. All of the soils in one unit, therefore, need about the same kind of management, though they may have formed from different kinds of parent material and in different ways.

The capability units are described in the following pages. The soils and their respective capability unit are listed in the "Guide to Mapping Units" at the back of this survey. Management suitable for all the soils in one unit is suggested. Suitable cropping systems for average soil conditions are described for each capability unit in terms of *high*, *medium*, *low*, *or very low* intensity. It is assumed that needed erosion control practices are used.

High-intensity cropping consists of row crops more than 1 year in 2 years.

Medium-intensity cropping consists of row crops 1 year in 2 to 3 years.

Low-intensity cropping consists of row crops 1 year in 5 years.

Very low intensity cropping consists of row crops less than 1 year in 5 years.

A cropping system can be varied, depending on the needs of the farmer and the intensity of soil and water conservation practices installed in a specific field.

Conservation practices include contour stripcropping, terraces, and sodded waterways on sloping soils. Wet soils generally need graded strips, terraces, and grassed waterways to remove surface water and to control erosion. Subsurface water generally can be removed by random tile lines or open ditches, if suitable outlets are available.

Practices to maintain and improve the organic-matter content and soil structure and to reduce erosion include the use of cover crops through winter, stubble mulching, minimum tillage, and use of green-manure crops in intensive rotations or continuous cultivations.

Lime and fertilizer should be applied according to soil tests and the needs of the crops.

Additional help in managing the soils can be obtained by consulting the local representative of the Soil Conservation Service, the County Agricultural Agent, or a member of the staff of the State Agricultural Experiment Station.

The names of soil series represented are mentioned in the description of each capability unit, but this does not necessarily mean that all the soils of a given series appear in the unit. To find the names of all the soils and the capability unit in which each one has been grouped, refer to the "Guide to Mapping Units" at the back of this survey. None of the mapping units of Strip mine spoil or of Urban land have been placed in capability units.

CAPABILITY UNIT I-1

In this unit are nearly level, deep, well-drained soils of the Chavies, Hazleton, and Westmoreland series. The Chavies soil is mostly on terraces, but the Hazleton and Westmoreland soils are on uplands.

These soils are easy to till, are permeable, and are moderate to high in available moisture capacity. The erosion hazard is slight. The Chavies and Hazleton soils are lower in natural fertility than the Westmoreland soils. Winterkilling of grain crops and alfalfa is slight.

These soils are well suited to all the crops commonly grown in the county, including potatoes and truck, nursery, and orchard crops. These soils are suited to high-intensity cropping, and no special conservation practices are needed. The limitations to farm use and management are slight.

CAPABILITY UNIT IIe-1

In this unit are deep, well-drained, gently sloping soils of the Allegheny, Clymer, Hazleton, and Westmoreland series. The Allegheny soil is mostly on terraces, and the Clymer, Hazleton, and Westmoreland soils are on uplands.

These soils are easy to till, are permeable to air and water, and are moderate to low in available moisture capacity. Surface runoff is medium. Except for the Westmoreland soil, which is high in natural fertility, these soils are moderate to low in natural fertility. Winterkilling of grain crops and alfalfa is slight to none.

These soils are well suited to all the crops commonly grown in the county, including truck, nursery, and orchard crops and potatoes. If not protected, the soils are subject to moderate erosion, and the limitations to use for cultivated crops are slight to moderate. These soils are

suited to medium-intensity cropping, and only a few to a moderate number of practices are needed to conserve soil and water.

CAPABILITY UNIT IIe-2

This unit consists of gently sloping, deep, somewhat poorly drained and moderately well drained, medium-textured soils on hilltops, lower valley slopes, and upland benches. The soils of this unit are in the Albrights, Clarksburg, Cookport, Ernest, Guernsey, Monongahela, and Wharton series.

The available moisture capacity and natural fertility are moderate to high. The permeability of the lower part of the subsoil is moderately slow to slow. The erosion hazard is moderate where the soils are not protected.

These soils are suited to the crops commonly grown in the area, except for alfalfa in long rotations. Winter grain and alfalfa are subject to winterkilling. The main limitation to use and management for farming is slope. These soils are suited to medium-intensity cropping if necessary conservation practices are used. Tile drains are needed to drain wet-weather springs and other wet and seepy areas. Contour strips and terraces are needed to help conserve soil and water. Keeping a good sod cover in the waterways and natural draws controls erosion. If row crops are followed by a cover crop, the soil is protected during winter and spring.

CAPABILITY UNIT IIe-3

This unit consists only of Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded. This is a moderately deep, well-drained soil on the uplands.

This soil has low available moisture capacity, has moderate permeability, and is strongly acid. The surface layer is easily worked and can be tilled early in spring.

The soil of this unit is suited to alfalfa and other crops that withstand droughtiness. Erosion hazard is moderate where the soil is not protected.

This soil is suited to medium-intensity cropping. Cover crops, terraces, diversions, and other conservation practices are needed to conserve soil and water. A good sod in drainageways prevents scouring.

CAPABILITY UNIT IIw-1

This unit consists of nearly level, deep, moderately well drained, medium-textured Lindside and Philo soils on alluvial flood plains. These soils are subject to flooding. They have a high water table late in winter and early in spring.

Available moisture capacity is high and permeability is moderate.

These soils are suited to high-intensity cropping if the wetter areas are tile drained. Flooding is of short duration and usually occurs outside the growing season. Wherever practical, digging of ditches to lower the water level of streams draining these soils will aid in locating and installing outlets for tile drains. These soils are suited to corn, small grains, and hay plants tolerant of wet soil conditions.

CAPABILITY UNIT IIw-2

This unit consists of nearly level, deep, medium-textured Cookport, Ernest, Monongahela, and Wharton soils that are moderately well drained. Cookport and Wharton soils are on the uplands, Monongahela soils are on stream terraces, and Ernest soils are on colluvial foot slopes.

These soils have a slowly permeable or moderately slowly permeable subsoil and moderate to high available moisture capacity.

These soils need drainage by tile or open drains. They are suited to high-intensity cropping if drained. Drainage is difficult because the permeability of the subsoil is restricted. The soils remain wet until late in spring.

These soils are suited to corn, small grain, and hay. By following row crops with a cover crop, the soil is protected in winter and early in spring.

CAPABILITY UNIT IIs-1

Gilpin channery silt loam, 0 to 3 percent slopes, is the only soil in this unit. It is a moderately deep, well-drained soil on the uplands.

The available moisture capacity is low. This soil is naturally strongly acid and is moderately permeable. The surface layer is easily worked, and tillage is possible early in spring. Droughtiness is the main limitation to use.

This soil is suited to medium-intensity cropping of alfalfa and other crops that withstand droughtiness during the growing season. Alfalfa, wheat, and barley are not subjected to heaving.

CAPABILITY UNIT IIIe-1

This unit consists of deep, well-drained Allegheny, Clymer, Hazleton, and Westmoreland soils. These sloping soils occur on terraces and uplands.

The soils of this unit are low to moderate in available moisture capacity. The erosion hazard is severe when these soils are cultivated.

These soils are suited to all of the crops commonly grown in the county, including alfalfa, potatoes, truck crops, and orchards. They are suited to medium-intensity cropping in combination with conservation practices. Adapted practices are contour strips, terraces, and cover crops. A good sod cover in the waterways and natural draws will also help conserve soil and water.

CAPABILITY UNIT IIIe-2

In this unit are gently sloping, deep and moderately deep, well-drained Brooke and Upshur soils on the uplands. The Brooke soil has a silty clay loam surface layer that is difficult to till. Easier to till is the silt loam surface layer of the Upshur soil. Where either soil is cultivated, the erosion hazard is severe.

The soils of this unit have slow permeability. Upon drying, the subsoil shrinks and cracks. The available moisture capacity is moderate to low. Crops grown on these soils respond well to additions of lime and fertilizer.

These soils are suited to most cultivated crops grown in the county. They are well adapted to alfalfa. Medium-intensity cropping is suitable where contour stripcropping, terracing, sodding waterways, and other conservation practices are used. Following row crops with a cover crop protects these soils in winter and early in spring.

CAPABILITY UNIT IIIe-3

In this unit are deep, moderately well drained or somewhat poorly drained Cavode, Clarksburg, Cookport, Ernest, Guernsey, Monongahela, and Wharton soils. These sloping soils of the uplands occur on the lower part of valley slopes and on terraces. In most places much of the original surface layer has eroded away.

These soils have a slowly permeable subsoil and a seasonal high water table. The available moisture capacity is moderate.

These soils are subject to severe erosion where cultivated. They are somewhat late drying out in spring.

These soils are suited to varieties of corn, small grain, and hay that are tolerant of wet soils. They need to be drained, limed, and fertilized for good crop growth. Alfalfa, wheat, and barley often are damaged by heaving in winter. These soils are suited to medium-intensity cropping if needed conservation practices are used. Needed in many places to control erosion are drainage of wet-weather springs with tile and use of terraces and contour strips. Following row crops with cover crops protects the soil in winter and early in spring. A good sod in drainageways prevents scouring.

CAPABILITY UNIT IIIe-4

Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded, is the only soil in this unit. It is a moderately deep, well-drained soil on the uplands.

The available moisture capacity is low. This soil is naturally strongly acid or very strongly acid. The permeability is moderate. The surface layer is easily worked, and tillage in early spring is possible.

This soil is suited to corn, small grains, and hay. It is subject to severe erosion where cultivated, and growth of shallow-rooted crops is slowed by droughtiness in dry years. In wet years, however, or in years when rainfall is well distributed, crop growth compares favorably with that on deep, well-drained soils.

This soil is suited to low-intensity cropping. Needed to conserve soil and water are cover crops, terraces, diversions, and other conservation practices. A good sod in drainageways prevents scouring.

CAPABILITY UNIT IIIw-1

In this unit are deep, poorly drained and somewhat poorly drained Atkins, Melvin, and Newark soils. These nearly level soils occur on narrow flood plains. The surface layer is wet most of the year because the water table is high.

The Newark soils are better drained than the Melvin and Atkins soils. All of the soils have high available moisture capacity.

These soils are suited to medium-intensity cropping. Floods last only a short time and normally occur in winter and early in spring. The low areas of these soils are difficult to drain with tile because the outlets are at or only slightly above stream level. Wherever practical, digging ditches to lower the water level of the streams that drain these soils aids in locating and installing outlets for tile drains.

CAPABILITY UNIT IIIw-2

This unit consists of deep, poorly drained and somewhat poorly drained Cavode, Library, and Tyler soils. These are nearly level to gently sloping soils on uplands and terraces.

The Tyler soil has a fragipan in the lower part of the subsoil, and the Cavode and Library soils have a clayey subsoil. The soils of this unit have moderate to low available moisture capacity. The surface layer is easily compacted if these soils are grazed or tilled when wet. Water moves so slowly through the subsoil that these soils remain waterlogged until late in spring. The soils are difficult to drain with tile because the subsoil is tight, is clayey, or has a fragipan.

These soils are suited to corn, small grains, and hay. Alfalfa, wheat, and barley are damaged by heaving in winter. These soils are suited to low-intensity cropping. Hay mixtures tolerant of wet soils are better adapted than plants that need well-drained soils. By following row crops with a cover crop, the soil is protected in winter and early in spring. Suitable conservation practices are tile drainage of seepy areas and springs and the use of terraces and contour strips. A good sod in drainageways prevents scouring.

CAPABILITY UNIT IVe-1

This unit consists of deep, well-drained, moderately steep Hazleton and Westmoreland soils. These medium-textured soils occur on uplands. In many places these soils have lost up to 75 percent of the surface layer through erosion.

The Hazleton soils are somewhat more acid than Westmoreland soils. The soils of this unit have moderate or moderately rapid permeability and low to moderate available moisture capacity.

These soils are subject to very severe erosion where cultivated. They are suited to a cropping system of hay, some small grains, and corn. Alfalfa grows well. Needed conservation practices include use of diversions, contour strips, and cover crops. Well-sodded waterways and natural drains also help to conserve soil and water.

CAPABILITY UNIT IVe-2

This unit consists of deep, somewhat poorly drained and moderately well drained Cavode, Clarksburg, Guernsey, and Wharton soils. These sloping to moderately steep soils occur on uplands and upper valley slopes. They are dissected by rills and gullies and are subject to very severe erosion when cultivated.

These soils are strongly acid to medium acid and have moderate available moisture capacity. Because these soils have a pan in the subsoil, they stay wet longer than nearby well-drained soils.

A cropping system of hay, small grains, and corn is adapted to these soils. Hay varieties tolerant of wet soils are suitable for planting. Alfalfa is damaged by heaving in winter. The use of diversions, contour strips, and cover crops helps to conserve soil and water. Elimination of seep areas and wet-weather springs is helped by tile drainage.

CAPABILITY UNIT IVe-3

In this unit are deep and moderately deep, well-drained Brooke and Upshur soils. These sloping soils occur on the uplands. They are difficult to till and have a fine-textured, slowly permeable subsoil that is sticky and plastic when wet. The soils of this unit are unstable, and slips and slides occur in some places.

These soils have low to moderate available moisture capacity. They normally are medium acid to neutral.

These soils are subject to very severe erosion where cultivated. They are suited to a cropping system of hay, small grains, and corn. Alfalfa grows well. Use of diversions, contour strips, and a good, heavy sod cover in the natural drainageways helps to conserve soil and water.

CAPABILITY UNIT IVe-4

Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded, is the only soil in this unit. It is a moderately deep, well-drained soil on the uplands. It is moderate in natural fertility and is mostly strongly acid to very strongly acid. The available moisture capacity is low. Very severe erosion is likely in cultivated areas.

This soil is suited to hay, corn, and alfalfa, though droughtiness is a concern in some years. Diversions, contour strips, and cover crops help to conserve soil and water. A good, heavy sod cover in the natural drainageways and waterways helps to prevent further erosion.

CAPABILITY UNIT IVw-1

This unit consists of deep, poorly drained Armagh, Brinkerton, Purdy, and Thorndale soils. These level to gently sloping soils occur on uplands, terraces, and low valley slopes. The Brinkerton and the Purdy soils are more affected by runoff and seepage from adjacent slopes than are Armagh and Thorndale soils.

The available moisture capacity is moderate to high. The subsoil is usually waterlogged in spring, late in fall, and in winter.

These soils are suited to a cropping system of hay, oats, and corn. Alfalfa, wheat, and barley are severely damaged by heaving in winter. Hay plants tolerant of wet soils are well adapted.

Tile lines supplemented with open ditches help to drain these soils. For those soils that are only slightly above the stream level, tile outlets are not readily available.

CAPABILITY UNIT IVw-2

Elkins silt loam is the only soil in this unit. It is a deep, very poorly drained, nearly level soil on narrow flood plains. It is subject to flooding and is wet most of the year. This soil is strongly acid or very strongly acid.

Because of flooding, this soil is better suited to hay than to tilled crops. Alfalfa often is severely damaged because of heaving in winter. Because this soil is only slightly above stream level, tile outlets are all difficult to locate. Where practical, ditches should be dug to lower the water table. The construction of diversions, at the base of adjacent slopes helps to reduce runoff and seepage flowing onto this soil.

CAPABILITY UNIT VIe-1

In this unit are moderately steep and steep, deep, moderately well drained Guernsey and Wharton soils that occur on the uplands. In cultivated areas, much of the original surface layer has eroded away and small gullies are common. In some areas the Guernsey soils have lost all of the original surface layer through erosion.

These soils erode readily because they are moderately steep and steep. The permeability is slow, and the available moisture capacity is moderate. These soils normally are strongly acid to medium acid.

Because of the erosion hazard, these soils are not suited to cultivated crops. They are suited to pasture plants tolerant of wet soils. Alfalfa is damaged by heaving in winter. Diversions constructed on less sloping adjoining soils help to conserve soil and water on these soils.

CAPABILITY UNIT VIe-2

This unit consists of moderately steep, deep and moderately deep, well-drained Brooke and Upshur soils on the uplands. The Brooke soil has a silty clay loam surface layer that is sticky and plastic when wet. The silt loam surface layer of the Upshur soil is less sticky and plastic than the surface layer of the Brooke soil.

The erosion hazard is very severe on the soils in this unit when they are cultivated. These soils are subject to slips and slides. The available moisture capacity is low to moderate, and the permeability is slow.

These soils are suited to pasture. The use of diversions and a good, heavy sod cover in the natural drainageways help to prevent further erosion.

CAPABILITY UNIT VIs-1

This unit consists of deep to moderately deep, well-drained, very stony Clymer, Dekalb, Gilpin, and Upshur soils. These nearly level to moderately steep soils occur on the uplands. The surface is covered with stones and boulders that are a foot to several feet in diameter.

These soils have moderate to low available moisture capacity. They are strongly acid to slightly acid. The stoniness is sufficient to interfere with cultivation of intertilled crops.

These soils are suited to use for pasture or woodland.

CAPABILITY UNIT VIs-2

This unit consists of level to moderately steep, deep, very stony Albrights, Buchanan, Cavode, Cookport, Ernest, and Wharton soils that are moderately well drained to somewhat poorly drained. These soils occur on the uplands and the lower slopes of valleys. Their surface is covered with boulders and stones that are a foot to several feet in diameter.

The permeability is moderately slow to slow. The available moisture capacity is moderate, but the soils are kept moist by water that seeps from higher slopes. The soils are mostly strongly acid. Stones are plentiful enough to interfere seriously with cultivation of intertilled crops.

These soils are suited to pasture plants that are tolerant of wet soils. They also are suited as woodland.

CAPABILITY UNIT VIIe-1

In this unit are steep and very steep, shallow to moderately deep, well-drained Dekalb, Gilpin, and Weikert soils. These soils are moderately permeable to rapidly permeable. The available moisture capacity is low.

Because slopes are steep, use of these soils is limited mainly to trees and wildlife.

CAPABILITY UNIT VIIs-1

The only soil in this unit is Andover very stony loam, 0 to 8 percent slopes. It is a deep, poorly drained soil on lower valley slopes. The surface is covered with stones or boulders a foot to several feet in diameter. Slow permeability in the subsoil and continual seepage from higher slopes keeps these soils waterlogged most of the year. The available moisture capacity is only moderate, but the soil is kept moist by water that seeps from higher slopes.

The stones on and in this soil limit use to trees or pasture. Normally, it is not practical or economical to drain these soils or to remove the stones and boulders for use as cropland.

CAPABILITY UNIT VIIs-2

This unit consists of steep or very steep, well-drained, very stony Dekalb, Gilpin, and Upshur soils that are mod-

erately deep to deep. The stones or boulders are from a foot to several feet in diameter. The permeability is rapid to slow, and the available moisture capacity is low to moderate.

Steep slopes and stones limit use of these soils to trees, wildlife habitat, and watershed.

CAPABILITY UNIT VIIIs-1

In this unit are sloping to steep Mine dumps and Rubble land that do not economically support tilled crops, pasture, or trees. On Rubble land more than 90 percent of the surface is covered with stones and boulders that are a foot to several feet in diameter. Mine dumps consist of refuse piles of slate, shale, and coal from mining.

These land types produce no vegetation of economic importance and are not suitable for farming.

Productivity Ratings

Table 1 shows predicted productivity ratings of the soils suitable for the farming of field crops and pasture commonly grown in the county. Not listed in the table are the following soils and land types, all of which are not suited to the crops specified:

Andover very stony loam, 0 to 8 percent slopes.
Cavode very stony silt loam, 0 to 8 percent slopes.
Cavode very stony silt loam, 8 to 25 percent slopes.
Dekalb channery loam, 30 to 60 percent slopes.
Dekalb very stony sandy loam, 30 to 80 percent slopes.
Gilpin very stony silt loam, 30 to 60 percent slopes.
Gilpin-Weikert channery silt loams, 30 to 60 percent slopes.
Mine dumps.
Rubble land.
Strip mine spoil (all mapping units).
Upshur very stony silt loam, 25 to 50 percent slopes.
Urban land (both mapping units).

The predictions in table 1 are averages for a period of 10 years or more, not for only one season. Each productivity rating denotes the productivity of the soil for a particular crop in relation to a standard index of 100. The standard index represents the average acre yield obtained on the more productive soils in the county. The average acre yield represented by the standard index is given at the head of the columns of each crop. The average acre yields are based on yields of crops during the favorable growing seasons when the soil survey was being made.

The predicted productivity ratings are given under two levels of management. In columns A are the ratings to be expected under the normal or prevailing management used by the average farmer in the county. In columns B are ratings that indicate yields that are expected in average growing seasons when improved management is practiced. The improved management indicated in columns B is based on the assumption that farmers use most of the currently adapted crop varieties, fertilization rates, and insect and disease control measures. Management practices are applied at the proper time and in a way that is effective. Suitable soil and water conservation practices are use of minimum tillage, contour tillage, stripcropping, crop residue management, diversions, drainage, waterways, or the like.

Irrigation is not considered in estimating these yields. The yields in columns B are not intended to be the maximum yields obtainable. These yields vary for the different soils, but normally represent an increase over present yields for the county.

An index of 50 indicates that the soil is only about half as productive of the specified crop as a soil having the index of 100. An index of more than 100, however, can be assigned to some soils. Guernsey silt loam, 3 to 8 percent slopes, moderately eroded, for example, has a rating in column A of 85 for corn grown for grain (85 x 80), 70 for oats, 95 for wheat, 80 for alfalfa-grass hay, 70 for clover-grass hay, 90 for bluegrass pasture, and 95 for tall grass pasture. Consequently, under the prevailing level of management, a farmer can expect yields of 68 bushels of corn per acre, 42 bushels of oats, 28.5 bushels of wheat, 2.4 tons of alfalfa-grass hay, 2.1 tons of clover-grass hay, 81 cow-acre-days of bluegrass pasture, and 142.5 cow-acre-days of tall grass pasture.

Under improved management this same Guernsey soil has a productivity rating of 140 for corn for grain, 120 for oats, 135 for wheat, 135 for alfalfa-grass hay, 120 for clover-grass hay, 145 for bluegrass pasture, and 150 for tall grass pasture. This means that yields per acre under improved management may equal 112 bushels of corn for grain, 72 bushels of oats, 40.5 bushels of wheat, 4.1 tons of alfalfa-grass hay, 3.6 tons of clover-grass hay, 130.5 cow-acre-days of bluegrass pasture, and 225 cow-acre-days of tall grass pasture. No ratings are given in table 1 for soils that are not suitable for the crops rated.

Use of Soils as Woodland [2]

Fayette County originally had a dense cover of trees, but clearing for farms and cutting for commercial purposes eliminated the virgin stands of timber. Now the commercial woodland occupies 52 percent of the land area and consists of second- and third-growth stands. The principal forest types (*13*) that make up the present woodland and the proportionate extent of each as given by U.S. Forest Service (*18*) follow.

	Percentage of total woodland in the county
Red oak	49
Northern red oak is predominant. Associates are black oak, scarlet oak, chestnut oak, and yellow-poplar.	
Sugar maple-beech-yellow birch	17
Sugar maple, beech, and yellow birch are the component species. Associates are basswood, red maple, hemlock, northern red oak, white ash, white pine, black cherry, yellow birch, and American elm.	
White oak	11
White oak is pure or predominant. Associated species are black oak, northern red oak, shagbark and bitternut hickories, white ash, aspen, and yellow-poplar.	
Chestnut oak	15
Chestnut oak is pure or predominant. The common associates are scarlet oak, white oak, black oak, blackgum, and red maple.	
Other forest types	8

Sawtimber makes up approximately 8 percent of the acreage in commercial forests, poletimber 49 percent, and seedlings and saplings the rest (*13*). The soils in this county generally can support a good growth of red oak, yellow-poplar, ash, and white pine. The stands in many

[2] By V. C. Miles, woodland specialist, Soil Conservation Service.

TABLE 1.—*Predicted productivity ratings of soils for specified field and forage crops under two levels of management*

[In columns A are productivity ratings for common management, and in columns B are ratings for improved management. Dashes indicate that the soil is not suited to the specified crop at the specified level of management]

Soil	Corn for grain (100=80 bushels per acre)		Oats (100=60 bushels per acre)		Wheat (100=30 bushels per acre)		Alfalfa-grass hay (100=3 tons per acre)		Clover-grass hay (100=3 tons per acre)		Bluegrass pasture (100=90 cow-acre-days)[1]		Tall grass-legume pasture (100=150 cow-acre-days)[1]	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Albrights silt loam, 3 to 8 percent slopes, moderately eroded	80	125	60	110	65	120	65	120	55	100	75	140	70	130
Albrights very stony silt loam, 0 to 8 percent slopes	---	---	---	---	---	---	---	---	---	---	65	120	---	---
Allegheny fine sandy loam, 3 to 8 percent slopes, moderately eroded	80	145	70	125	85	150	85	150	65	120	85	155	85	155
Allegheny fine sandy loam, 8 to 15 percent slopes, moderately eroded	70	130	65	120	75	135	75	135	55	100	75	140	80	150
Atkins silt loam	80	125	55	100	55	100	---	---	55	100	70	150	60	115
Brinkerton and Armagh silt loams, 0 to 3 percent slopes	60	115	55	100	---	---	---	---	35	65	70	130	55	100
Brinkerton and Armagh silt loams, 3 to 8 percent slopes	60	115	55	100	---	---	---	---	35	65	70	130	55	100
Brooke silty clay loam, 3 to 8 percent slopes, moderately eroded	80	120	70	110	90	135	100	150	75	120	90	140	100	150
Brooke silty clay loam, 8 to 15 percent slopes, moderately eroded	75	115	65	100	75	120	100	150	75	120	90	140	95	150
Brooke silty clay loam, 15 to 25 percent slopes, moderately eroded	---	---	---	---	---	---	---	---	---	---	75	120	---	---
Buchanan very stony loam, 0 to 8 percent slopes	---	---	---	---	---	---	---	---	---	---	60	110	---	---
Buchanan very stony loam, 8 to 25 percent slopes	---	---	---	---	---	---	---	---	---	---	55	100	---	---
Cavode silt loam, 3 to 8 percent slopes, moderately eroded	60	105	55	100	55	100	---	---	55	100	85	150	60	115
Cavode silt loam, 8 to 15 percent slopes, moderately eroded	55	100	50	90	55	100	---	---	55	100	85	150	60	115
Cavode silt loam, 15 to 25 percent slopes, moderately eroded	50	95	45	85	45	85	---	---	45	80	70	130	55	100
Chavies fine sandy loam	85	160	70	125	70	150	85	150	65	120	85	155	90	160
Clarksburg-Guernsey silt loams, 2 to 8 percent slopes	90	140	75	120	85	135	85	135	75	120	100	150	95	150
Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded	80	125	70	110	85	135	85	135	75	120	95	145	95	150
Clarksburg-Guernsey silt loams, 15 to 25 percent slopes, moderately eroded	70	105	60	95	65	100	75	120	65	100	85	135	85	135
Clymer channery loam, 3 to 12 percent slopes, moderately eroded	75	140	65	120	75	135	75	135	55	100	80	145	90	160
Clymer channery loam, 12 to 20 percent slopes, moderately eroded	70	125	60	110	60	110	75	135	55	100	75	135	80	140
Clymer very stony loam, 0 to 12 percent slopes	---	---	---	---	---	---	---	---	---	---	65	115	---	---
Clymer very stony loam, 12 to 30 percent slopes	---	---	---	---	---	---	---	---	---	---	55	105	---	---
Cookport loam, 0 to 3 percent slopes	70	125	60	110	75	135	65	120	55	100	75	140	75	135
Cookport loam, 3 to 8 percent slopes, moderately eroded	70	125	60	110	75	135	65	120	55	100	75	140	75	135
Cookport loam, 8 to 15 percent slopes, moderately eroded	65	115	55	100	65	120	65	120	55	100	70	135	70	130
Cookport very stony loam, 0 to 8 percent slopes	---	---	---	---	---	---	---	---	---	---	60	110		---
Cookport very stony loam, 8 to 25 percent slopes	---	---	---	---	---	---	---	---	---	---	55	100	---	---

See footnote at end of table.

TABLE 1.—*Predicted productivity ratings of soils for specified field and forage crops under two levels of management*—Continued

Soil	Corn for grain (100=80 bushels per acre)		Oats (100=60 bushels per acre)		Wheat (100=30 bushels per acre)		Alfalfa-grass hay (100=3 tons per acre)		Clover-grass hay (100=3 tons per acre)		Bluegrass pasture (100=90 cow-acre-days)[1]		Tall grass-legume pasture (100=150 cow-acre-days)[1]	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Dekalb very stony sandy loam, 0 to 12 percent slopes	------	------	------	------	------	------	------	------	------	------	55	100	------	------
Dekalb very stony sandy loam, 12 to 30 percent slopes	------	------	------	------	------	------	------	------	------	------	40	80	------	------
Elkins silt loam	55	115	50	90	------	------	------	------	55	100	85	150	60	115
Ernest silt loam, 0 to 3 percent slopes	80	125	60	120	75	135	65	120	55	100	75	140	70	130
Ernest silt loam, 3 to 8 percent slopes, moderately eroded	80	125	60	110	85	135	65	120	55	100	75	140	70	130
Ernest silt loam, 8 to 15 percent slopes, moderately eroded	60	115	55	100	65	120	65	120	55	100	65	130	65	125
Ernest very stony silt loam, 0 to 8 percent slopes	------	------	------	------	------	------	------	------	------	------	65	115	------	------
Ernest very stony silt loam, 8 to 25 percent slopes	------	------	------	------	------	------	------	------	------	------	60	105	------	------
Gilpin channery silt loam, 0 to 3 percent slopes	65	115	55	100	65	120	65	120	55	100	70	130	70	130
Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded	60	110	55	100	65	115	65	120	55	100	70	130	70	120
Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded	55	100	50	90	55	100	65	120	55	100	65	120	65	120
Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded	45	85	40	75	45	85	45	85	45	85	60	110	55	100
Gilpin very stony silt loam, 0 to 12 percent slopes	------	------	------	------	------	------	------	------	------	------	60	110	------	------
Gilpin very stony silt loam, 12 to 30 percent slopes	------	------	------	------	------	------	------	------	------	------	40	70	------	------
Guernsey silt loam, 3 to 8 percent slopes, moderately eroded	85	140	70	120	95	135	80	135	70	120	90	145	95	150
Guernsey silt loam, 8 to 15 percent slopes, moderately eroded	80	125	65	110	75	120	80	135	65	120	90	140	95	150
Guernsey silt loam, 15 to 25 percent slopes, moderately eroded	65	105	55	95	60	100	70	120	60	100	80	130	85	130
Guernsey silt loam, 25 to 35 percent slopes, moderately eroded	------	------	------	------	------	------	------	------	------	------	65	105	------	------
Guernsey silty clay loam, 8 to 15 percent slopes, severely eroded	60	100	50	85	55	90	65	100	55	85	70	120	80	115
Guernsey silty clay loam, 15 to 25 percent slopes, severely eroded	------	------	------	------	------	------	------	------	------	------	60	100	------	------
Hazleton channery loam, 0 to 3 percent slopes	75	135	65	120	75	135	80	145	65	120	80	145	80	150
Hazleton channery loam, 3 to 12 percent slopes, moderately eroded	75	135	65	120	75	135	70	135	55	100	80	145	80	150
Hazleton channery loam, 12 to 20 percent slopes, moderately eroded	65	125	60	110	60	105	65	125	55	100	75	135	75	135
Hazleton channery loam, 20 to 30 percent slopes, moderately eroded	55	100	50	90	45	85	60	115	45	85	65	120	70	125
Library silty clay loam, 2 to 8 percent slopes, moderately eroded	60	115	50	95	55	100	------	------	55	100	80	145	65	120
Lindside silt loam	105	160	85	135	110	165	100	150	85	140	110	170	100	160
Melvin and Newark silt loams	95	145	75	120	------	------	------	------	65	100	100	150	70	115
Monongahela silt loam, 0 to 3 percent slopes	75	140	65	120	85	150	75	135	75	140	75	140	75	135
Monongahela silt loam, 3 to 8 percent slopes, moderately eroded	75	140	65	120	85	150	75	135	75	140	75	135	75	135

See footnote at end of table.

TABLE 1.—*Predicted productivity ratings of soils for specified field and forage crops under two levels of management*—Continued

Soil	Corn for grain (100=80 bushels per acre)		Oats (100=60 bushels per acre)		Wheat (100=30 bushels per acre)		Alfalfa-grass hay (100=3 tons per acre)		Clover-grass hay (100=3 tons per acre)		Bluegrass pasture (100=90 cow-acre-days)[1]		Tall grass-legume pasture (100=150 cow-acre-days)[1]	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Monongahela silt loam, 8 to 15 percent slopes, moderately eroded	65	120	60	110	75	135	65	120	55	100	70	130	70	125
Philo silt loam	85	150	70	125	85	150	85	145	60	120	85	155	85	155
Purdy silt loam	50	90	50	90	------	------	------	------	55	100	80	130	60	105
Thorndale silt loam, 0 to 3 percent slopes	75	115	70	110	------	------	------	------	55	100	65	120	65	120
Thorndale silt loam, 3 to 8 percent slopes, moderately eroded	75	115	75	120	------	------	------	------	55	100	65	120	65	120
Tyler silt loam	70	125	60	110	------	------	------	120	55	100	75	135	70	130
Upshur silt loam, 3 to 8 percent slopes, moderately eroded	85	135	85	130	100	150	100	150	75	120	100	150	100	155
Upshur silt loam, 8 to 15 percent slopes, moderately eroded	80	105	70	110	90	135	100	150	75	120	90	140	90	140
Upshur silt loam, 15 to 25 percent slopes, moderately eroded	------	------	------	------	------	------	------	------	------	------	70	110	------	------
Upshur very stony silt loam, 0 to 8 percent slopes	------	------	------	------	------	------	------	------	------	------	80	125	------	------
Upshur very stony silt loam, 8 to 25 percent slopes	------	------	------	------	------	------	------	------	------	------	65	105	------	------
Westmoreland channery silt loam, 0 to 3 percent slopes	100	150	90	135	110	165	110	170	75	120	100	150	100	155
Westmoreland channery silt loam, 3 to 12 percent slopes	95	145	80	125	110	165	110	170	75	120	100	150	100	155
Westmoreland channery silt loam, 12 to 20 percent slopes, moderately eroded	85	130	75	115	100	150	100	150	65	100	90	140	90	140
Westmoreland channery silt loam, 20 to 30 percent slopes, moderately eroded	70	110	60	95	70	110	85	135	55	85	70	110	85	130
Wharton silt loam, 0 to 3 percent slopes	70	125	65	120	75	135	75	135	65	120	80	145	80	140
Wharton silt loam, 3 to 8 percent slopes, moderately eroded	70	125	65	120	75	135	75	135	65	120	80	145	80	140
Wharton silt loam, 8 to 15 percent slopes, moderately eroded	60	110	60	110	65	120	75	135	55	100	75	135	75	135
Wharton silt loam, 15 to 25 percent slopes, moderately eroded	50	90	50	90	55	100	55	100	45	85	65	120	60	115
Wharton silt loam, 25 to 35 percent slopes, moderately eroded	------	------	------	------	------	------	------	------	------	------	50	95	------	------
Wharton very stony silt loam, 0 to 8 percent slopes	------	------	------	------	------	------	------	------	------	------	60	110	------	------
Wharton very stony silt loam, 8 to 30 percent slopes	------	------	------	------	------	------	------	------	------	------	55	100	------	------

[1] Cow-acre-days is a term used to express the carrying capacity of a pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture is grazed during a single grazing season without injury to the sod. An acre of pasture that provides 30 days of grazing for 2 cows has a carrying capacity of 60 cow-acre-days.

wooded areas, however, are made up dominantly of chestnut oak, scarlet oak, white oak, and red maple. Trees grow slowly on the shallow soils and on the deep, very poorly drained soils.

By using good management, a landowner can encourage growth of the more desirable kinds of trees. The soils and the climate are favorable to this growth, and help in planning a program to improve woodland can be obtained from local technicians. How much effort the landowner is willing to make toward improving his woodland probably depends on general economic conditions.

The returns from soils that provide excellent, very good, and good growing sites generally justify the cost of management (fig. 7). Consideration should be given to the potential yield, the quality of the particular species growing on the site, and the market potential. The species and number of poor stems growing on such sites may prohibit investment for management. If this is so, the conversion of these sites from their present state to their potential capacity may not be economically justifiable.

Management for soils that are fair growing sites is the most difficult to determine, but a thorough evaluation of the woodland regarding species and quality of stems growing on the site is essential. Also, the market should be investigated. In determining the intensity of management, a proper analysis of all of these interrelated factors is essential.

The returns from the soils that are poor growing sites generally do not economically justify management for producing wood products. For these soils, however, woodland in most places is the most practical land use. Because of unfavorable soil characteristics, these soils generally do not have a profitable return in cropland or grassland. Although returns may be slight to none for woodland, this land use is the most economical.

Seventy-one percent of the existing woodland in the county is on soils that are excellent, very good, and good woodland sites. Other woodland is classified as follows: 22 percent, fair sites; 5 percent, poor sites; 1 percent, variable (strip mine spoil, culm piles, and the like); and 1 percent, noncommercial.

Figure 7.—**A good site for yellow-poplar on Dekalb channery loam, 30 to 60 percent slopes.**

In table 2 interpretations are given for use of soils as woodland. For each soil the table indicates site quality, species suitability, and some of the hazards and limitations that affect woodland management.

Interpretations for Mine dumps (Md), Rubble land (Ru), Strip mine spoil (SmB, SmD, SmF, SnB, SnD, SnF), and Urban land (UrB, UrD) are not listed in table 2. For information about establishing trees on areas of Strip mine spoil, consult "A Guide for Revegetating Bituminus Strip Mine Spoil in Pennsylvania." Rubble land and Urban land are not suited to the production of commercial tree crops.

The following paragraphs discuss the columns indicated in table 2.

Site quality indicates the ability of the soils to produce timber. The ratings are based on sample plots located in the county and in adjacent counties. Other soils in the county that have characteristics similar to those of the soils studied were assumed to have about the same rating. The yield information for yellow-poplar is based on data from E. F. McCarthy (unpublished thesis). Information on oak is based on data by G. L. Schnur (*11*). The ratings are based on the average height attained by the dominant and codominant trees at the age of 50 years. Foresters using this rating can determine the volume of timber that normal stands produce at different ages.

Site quality for yellow-poplar and upland oaks is *excellent* if the site index is 95+ for yellow-poplar and 85+ for upland oaks. The yield in board feet per acre at the age of 50 years is 32,150 for yellow-poplar and more than 13,750 for upland oaks. Site quality for these trees is *very good* if the site index is 85 to 94 for yellow-poplar and 75 to 84 for upland oaks. The yield in board feet per acre at the age of 50 years is 24,400 for yellow-poplar and 13,750 for upland oaks. Site quality is *good* if the site index is 75 to 84 for yellow-poplar and 65 to 74 for upland oaks. The yield in board feet per acre at the age of 50 years is 17,620 for yellow-poplar and 9,750 for upland oaks. Site quality is *fair* if the site index for yellow-poplar is 55 to 64 and less than 54 for upland oaks. The yield in board feet per acre at the age of 50 years is 5,600 for yellow-poplar and 3,250 or less for upland oaks.

The site index for white pine, sugar maple, ash, larch, and other trees varies. The better sites have the taller trees of the same species at 50 years of age, but then growth decreases. More information on site index for other tree species can be obtained from the Soil Conservation Service and the Pennsylvania Department of Forests and Waters.

Species suitability is given in table 2 for each soil series. The trees named are well suited to planting or seeding and to the native trees to be favored in the existing stands. The objectives of the landowner determine the species to favor when plantations are started.

Erosion hazard refers to the risk of erosion and indicates the amount or intensity of practices required to reduce or control erosion on the different soils. A rating of *slight* indicates that the risk of erosion is low when wood products are harvested and that few, if any, practices are needed to control erosion. A rating of *moderate* indicates that erosion control measures are needed on skid trails and logging roads immediately after wood products are harvested. A rating of *severe* indicates that erosion, especially gullying, is severe where wood products are harvested. Harvesting and other operations should be done across the slope as much as possible. Skid trails and logging roads should be laid out on the lowest possible grades, and water-disposal systems should be maintained with care during logging. Erosion control measures should be applied on logging roads and skid trails immediately after logging is done.

Equipment limitations refer to the degree that characteristics of the soils and topographic features restrict or prevent the use of equipment for harvesting trees or planting seedlings. Steepness of slope, stoniness, and wetness of the soils are the principal characteristics that restrict the use of equipment. The rating is *slight* if the limitations are very few. A rating of *moderate* indicates that some problems exist, such as those caused by stones and boulders, moderately steep slopes, or wetness during part of the year. A rating of *severe* indicates that the use of equipment is severely limited by steepness, stoniness, or prolonged wetness of the soil. Track-type equipment is best for general use on the soils that are severely limited, and winches or other special equipment may be needed on these soils.

Seedling mortality refers to the loss of naturally occurring or planted tree seedlings as a result of unfavorable characteristics of the soil. The rating is *slight* if the expected loss is less than 25 percent of the seedlings. A rating of *moderate* indicates expected mortality between 25 and 50 percent, and a rating of *severe* indicates expected mortality greater than 50 percent. Needed for adequate and immediate restocking where seedling mortality is severe are considerable replanting, special preparation of seedbeds, and superior planting methods. A rating of severe also means that natural restocking cannot be expected.

Plant competition refers to the rate at which brush, grass, and undesirable trees are likely to invade the different kinds of soil. It is rated *slight* if competition does not prevent natural regeneration and early growth and does not interfere with adequate development of planted seedlings. It is *moderate* if competition delays the establishment and slows the growth of a natural or planted stand, but does not prevent the natural development of a fully stocked, natural stand of trees. The rating is *severe* if competition prevents adequate natural or artificial regeneration without intensive preparation of the site and maintenance treatments, such as weeding.

Windthrow hazard is evaluated after study of the factors that control the development of tree roots and therefore the risk that trees will be uprooted by wind. The hazard is rated *slight* if trees are not expected to be blown down in commonly occuring winds. It is *moderate* if some trees are expected to be blown down during times when the soil is excessively wet and the velocity of the wind is high. A rating of *severe* indicates that many trees are expected to be blown down when the soil is wet and the velocity of the wind is moderate or high.

Wildlife [3]

In this subsection the suitability of the soils in Fayette County for producing good habitats for wildlife is discussed.

Because game and nongame birds and animals are important in Fayette County, wildlife values should be con-

[3] Prepared in consultation with CLAYTON HEINEY, wildlife biologist, Soil Conservation Service, Harrisburg, Pa.

TABLE 2.—*Soil interpretations*

Series and map symbols	Site quality: Sugar maple, ash, upland oak	Site quality: Yellow-poplar	Species suitability: To favor in existing stands	Species suitability: For planting or seeding
Albrights: AbB2, AcB	Good	Good	Red oak, yellow-poplar, ash, sugar maple.	Larch, white pine, Norway spruce, white spruce.
Allegheny: AlB2, AlC2	Very good	Very good	Red oak, yellow-poplar, black walnut, ash, sugar maple.	Yellow-poplar, black walnut, larch, white pine, Norway spruce.
Andover: AnB	Good	Good	Red oak, yellow-poplar, ash.	Larch, white pine, white spruce.
Armagh. (Mapped only with Brinkerton soils.)				
Atkins: At	Generally poor, but excellent for pin oak.	Not suited	Pin oak, red maple	White pine, white spruce
Brinkerton and Armagh: BaA, BaB	Good	Good	Red oak, yellow-poplar, ash.	Larch, white pine, white spruce.
Brooke: BrB2, BrC2, BrD2	Good	Good	Red oak, yellow-poplar, ash, sugar maple.	Larch, white pine, black locust, Norway spruce.
Buchanan: BuB, BuD	Good	Good	Red oak, yellow-poplar, ash, sugar maple.	Larch, white pine, yellow-poplar, Norway spruce.
Cavode: CaB2, CaC2, CaD2, CdB, CdD.	Very good	Very good	Red oak, yellow-poplar, sugar maple, white pine, ash.	White pine, larch, yellow-poplar, white spruce, Norway spruce.
Chavies: Ce	Very good	Very good	Red oak, black walnut, yellow-poplar, ash, sugar maple.	Yellow-poplar, black walnut, larch, white pine, Norway spruce.
Clarksburg-Guernsey: CgB, CgC2, CgD2.	Very good	Very good	Red oak, yellow-poplar, ash, sugar maple.	Yellow-poplar, larch, Norway spruce, white pine.
Clymer: ClB2, ClC2, CmB, CmD	Very good	Very good	Red oak, yellow-poplar, ash, sugar maple.	Yellow-poplar, larch, Norway spruce, white pine, Virginia pine.
Cookport: CoA, CoB2, CoC2, CpB, CpD.	Very good	Very good	Red oak, ash, yellow-poplar, sugar maple.	Yellow-poplar, larch, white pine, white spruce, Norway spruce.
Dekalb: DaF	Good	Good	Red oak, yellow-poplar, ash, sugar maple, red maple.	White pine, larch, Norway spruce, yellow-poplar.
DbB, DbD, DbF	Fair	Not suitable	White pine, black oak, chestnut oak, Virginia pine.	Virginia pine, white pine, pitch pine.
Elkins: Ek	Poor	Not suitable	Pin oak, red maple, sycamore.	White pine, white spruce
Ernest: ErA, ErB2, ErC2, EsB, EsD	Very good	Very good	Red oak, yellow-poplar, sugar maple, ash.	Yellow-poplar, larch, white pine, Norway spruce.
Gilpin: GcA, GcB2, GcC2, GcD2, GnB, GnD, GnF.	Very good	Very good	Red oak, ash, yellow-poplar, white pine, sugar maple.	White pine, yellow-poplar, larch, Norway spruce.
Gilpin-Weikert: GrF	Fair	Not suitable	Virginia pine, chestnut oak, black oak, red oak.	Virginia pine, white pine

for woodland

Hazards and limitations				
Erosion hazard	Equipment limitations	Seedling mortality	Plant competition	Windthrow hazard
Slight	Slight	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight	Slight	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight	Severe	Severe	Severe for conifers; severe for hardwoods.	Moderate.
Slight	Severe	Severe	Severe for conifers; severe for hardwoods.	Moderate.
Slight	Severe	Severe	Severe for conifers; severe for hardwoods.	Moderate.
Slight on BrB2; moderate on BrC2; severe on BrD2.	Moderate on BrB2 and BrC2; severe on BrD2.	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight on BuB; moderate on BuD.	Slight on BuB; moderate on BuD.	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight on CaB2 and CdB; moderate on CaC2; severe on CaD2 and CdD.	Moderate	Moderate	Severe for conifers; severe for hardwoods.	Moderate.
Slight	Slight	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight on CgB; moderate on CgC2; severe on CgD2.	Slight	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight	Slight on ClB2, ClC2, and CmB; moderate on CmD.	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight on CoA, CoB2, CoC2, and CpB; moderate on CpD.	Slight	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Moderate	Severe	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight on DbB and DbD; modrate on DbF.	Slight on DbB; moderate on DbD; severe on DbF.	Moderate	Slight for conifers; slight for hardwoods.	Slight.
Slight	Severe	Severe	Severe for conifers; severe for hardwoods.	Severe.
Slight on ErA, ErB2, and EsB; moderate on ErC2; severe on EsD.	Slight on ErA, ErB2, ErC2, and EsB; moderate on EsD.	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight on GcA, GcB2, GcC2, and GnB; moderate on GcD2, and GnD; severe on GnF.	Slight on GcA, GcB2, GcC2, and GnB; moderate on GcD2 and GnD; severe on GnF.	Moderate	Severe for conifers; moderate for hardwoods.	Slight.
Moderate	Severe	Severe	Slight for conifers; slight for hardwoods.	Moderate.

TABLE 2.—*Soil interpretations*

Series and map symbols	Site quality: Sugar maple, ash, upland oak	Site quality: Yellow-poplar	Species suitability: To favor in existing stands	Species suitability: For planting or seeding
Guernsey: GsB2, GsC2, GsD2, GsE2, GtC3, GtD3.	Very good	Very good	Red oak, ash, yellow-poplar, sugar maple.	Larch, yellow-poplar, white pine, Norway spruce.
Hazleton: HaA, HaB2, HaC2, HaD2	Good	Good	Red oak, yellow-poplar, ash, sugar maple.	White pine, larch, Norway spruce, Virginia pine, yellow-poplar.
Library: LbB2	Very good	Very good	Red oak, yellow-poplar, ash, sugar maple.	White pine, yellow-poplar, larch, Norway spruce.
Lindside: Ln	Excellent	Excellent	Red oak, yellow-poplar, black walnut, ash, sugar maple.	White pine, yellow-poplar, black walnut, larch, Norway spruce.
Melvin and Newark: Mc	Fair	Not suitable	Pin oak, red maple, sycamore.	White pine, white spruce
Monongahela: MoA, MoB2, MoC2	Good	Good	Red oak, yellow-poplar, ash, sugar maple, white maple.	White pine, yellow-poplar, larch, Norway spruce.
Newark. (Mapped only with Melvin soils.)				
Philo: Ph	Excellent	Excellent	Red oak, black walnut, yellow-poplar, ash, sugar maple.	White pine, black walnut, yellow-poplar, larch, Norway spruce.
Purdy: Pu	Fair		Pin oak, red maple, sycamore.	White pine, white spruce
Thorndale: ThA, ThB2	Fair	Not suitable	Pin oak, red maple, sycamore.	White pine, white spruce.
Tyler: Ty	Very good	Very good	Red oak, ash, yellow-poplar, sugar maple.	White pine, yellow-poplar, larch, Norway spruce, white spruce.
Upshur: UhB2, UhC2, UhD2, UpB, UpD, UpF.	Good	Good	Red oak, yellow-poplar, ash, sugar maple, Virginia pine.	Yellow-poplar, larch, white pine, Norway spruce, Virginia pine.
Weikert. (Mapped only with Gilpin soils.)				
Westmoreland: WcA, WcB, WcC2, WcD2.	Very good	Very good	Red oak, yellow-poplar, ash, sugar maple, black walnut.	White pine, yellow-poplar, larch, Norway spruce, black walnut, Virginia pine.
Wharton: WrA, WrB2, WrC2, WrD2, WrE2, WsB, WsE.	Very good	Very good	Red oak, yellow-poplar, ash, sugar maple.	White spruce, yellow-poplar, larch, Norway spruce.

for woodland—Continued

Hazards and limitations				
Erosion hazard	Equipment limitations	Seedling mortality	Plant competition	Windthrow hazard
Slight on GsB2; moderate on GsC2 and GtC3; severe on GsD2, GsE2, and GtD3.	Slight on GsB2, GsC2, and GtC3; moderate on GsD2, GsE2, and GtD3.	Slight on GsB2, GsC2, GsD2, and GsE2; moderate on GtC3 and GtD3.	Severe for conifers; moderate for hardwoods.	Slight.
Slight	Slight on HaA, HaB2, and HaC2; moderate-on HaD2.	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight	Moderate	Moderate	Severe for conifers; severe for hardwoods.	Moderate.
Slight	Slight	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight	Severe	Severe	Severe for conifers; severe for hardwoods.	Moderate.
Slight on MoA and MoB2; moderate on MoC2.	Slight	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight	Moderate	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight	Severe	Severe	Moderate for conifers; moderate for hardwoods.	Severe.
Slight	Severe	Severe	Moderate for conifers; moderate for hardwoods.	Severe.
Slight	Moderate	Moderate	Severe for conifers; severe for hardwoods.	Moderate.
Slight on UhB2 and UpB; moderate on UhC2; severe on UhD2, UpD, and UpF.	Moderate	Slight	Moderate for conifers; slight for hardwoods.	Slight.
Slight on WcA, WcB, and WcC2; moderate on WcD2.	Slight on WcA, WcB, and WcC2; moderate on WcD2.	Slight	Severe for conifers; moderate for hardwoods.	Slight.
Slight on WrA, WrB2, and WsB; moderate on WrC2; severe on WrD2, WrE2, and WsE.	Slight on WrA, WrB2, WrC2, and WsB; moderate on WrD2, WrE2, and WsE.	Slight	Severe for conifers; moderate for hardwoods.	Slight.

sidered in planning for land use. Open spaces may be planned in the form of nature study areas, wildlife refuges, regulated shooting grounds, or an area left in its natural state for wildlife.

Each species of wildlife needs certain kinds of vegetation and water for food and cover to sustain itself. Soil characteristics determine, to a large extent, the kind and amount of vegetation that can be produced on a site. Therefore, predictions can be made about the suitability of a soil to produce habitat elements essential for wildlife (*1*).

The species of wildlife in the county consist of squirrel, cottontail rabbits, muskrat, deer, quail, pheasants, dove, woodcock, grouse, wild turkey, wild duck, and many nongame songbirds.

In table 3 the soils are rated according to their suitability for eight elements of wildlife habitat and for three kinds, or groups, of wildlife. Several land types are variable in characteristics and have not been rated, though they may furnish some food and cover for wildlife. These land types are Mine dumps (Md), Rubble land (Ru), Strip mine spoil (SmB, SmD, SmF, SnB, SnD, SnF), and Urban land (UrB, UrD).

The numerical ratings 1, 2, 3, and 4, used in table 3 indicate progressively greater limitations that affect use for the specified habitat element or kind of wildlife. A rating of 1 indicates that the soil is *well suited* to the habitat element or kind of wildlife. The habitat is easily created, maintained, or improved. Few limitations affect management, and satisfactory results are easily obtained. A rating of 2 shows that the soil is *suited* to the habitat element or kind of wildlife. The habitat can be created, maintained, or improved, but limitations that affect management are moderate. A rating of 3 means *poorly suited.* This indicates that the habitat can be created, maintained, or improved but severe limitations may make it difficult or expensive to maintain. A rating of 4 shows that the specified soil is *unsuited* for the production of the specified habitat or it is impractical to improve or maintain. Satisfactory results are improbable.

It should be noted that these ratings indicate only potential suitability because changes in land use may completely alter site conditions and thus alter the species of wildlife that inhabit the area. Also, the ability of wildlife to move from place to place is not considered in making these ratings.

The eight wildlife habitats for which the soils in table 3 are rated are defined as follows:

Grain and seed crops are domestic grain and seed-producing annual plants, such as corn, wheat, and millet.

Grasses and legumes are domestic perennial grasses and herbaceous legumes, such as timothy, alfalfa, and reed canarygrass.

Wild herbaceous upland plants are wild perennial grasses and weeds, such as goldenrod, ragweed, and pokeweed.

Hardwood woody plants are deciduous trees, shrubs, or vines, such as oaks, dogwoods, grapes, and briars.

Coniferous woody plants are cone-bearing trees and shrubs, such as pines, cedars, and yews. Suitability ratings for this habitat element are based on retarded growth and delayed canopy closure.

Wetland food plants are wild herbaceous plants on moist to wet sites, but not submerged and floating aquatic plants. Examples of wetland food plants are smartweeds, bullrushes, reed canarygrass, and cattails.

Shallow water developments are areas of water that have been made by building low dikes and levees, digging shallow excavations, establishing level ditches, and building devices to control the water level of marshy streams. Generally, the water should be less than 18 inches deep.

Excavated ponds are dug-out areas or a combination of dug-out areas and low dikes that hold water of suitable quality, of suitable depth, and in ample supply for the production of fish or wildlife. Such a pond should have a surface area of at least one-quarter acre and an average depth of 8 feet or more in at least a quarter of the area. Also required is a dependable high water table or another source of unpolluted water of low acidity.

Based on the suitability of the soils for each of the eight habitat elements, the soils were rated according to their suitability for producing three major kinds of wildlife. These ratings indicate only potential suitability. Land use greatly affects the site conditions and the species of wildlife that live in any area.

Openland wildlife consists of birds and mammals commonly found in crop fields, in meadows, and pastures, and on nonforested overgrown soils. Common examples of openland wildlife are quail, pheasants, doves, woodcock, cottontail rabbits, meadowlarks, killdeer, and field sparrows. The elements used in evaluating suitability of soils for openland wildlife are grain and seed crops, grasses and legumes, wild herbaceous upland plants, and, to a lesser degree, hardwood woody plants.

Woodland wildlife consists of birds and mammals that are commonly found in wooded areas. Examples are grouse, wild turkeys, deer, squirrels, wood thrushes, warblers, and vireos. The habitat elements used in evaluating suitability of soils for woodland wildlife are grasses and legumes, wild herbaceous upland plants, hardwood woody plants, and coniferous woody plants.

Wetland wildlife consists of birds and mammals that are commonly found in marshes and swamps. Examples are wild ducks, wild geese, rails, snipe, muskrat, mink, and beaver.

Engineering Uses of the Soils[4]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage control systems. Among the soil properties most important to the engineer are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size and distribution, plasticity, and acidity. Depth to a seasonal high water table and depth to bedrock are also important.

This soil survey of Fayette County contains information that can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.

[4] Prepared in cooperation with LLOYD THOMAS, civil engineer, Soil Conservation Service, and with the Pennsylvania Department of Transportation.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*

[Figure 1 denotes well suited: 2, suited; 3, poorly suited; 4, unsuited]

Series and map symbols	Wildlife habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Kinds of wildlife: Openland wildlife	Woodland wildlife	Wetland wildlife
Albrights:											
AbB2	2	1	1	1	3	4	4	3	1	1	4
AcB	4	3	1	1	3	3	4	3	3	2	4
Allegheny: AlB2, AlC2	2	1	1	1	3	4	4	4	1	1	4
Andover: AnB	4	3	2	2	2	3	4	2	3	2	4
Armagh. (Mapped only with Brinkerton soils.)											
Atkins: At	2	1	1	1	3	3	3	3	1	1	3
Brinkerton and Armagh:											
BaA	3	3	2	2	2	1	1	1	3	2	1
BaB	3	3	2	2	2	3	4	1	3	2	3
Brooke:											
BrB2, BrC2	2	1	1	1	3	4	4	4	1	1	4
BrD2	3	2	1	1	3	4	4	4	2	1	4
Buchanan:											
BuB	4	3	1	1	3	3	4	3	3	2	4
BuD	4	3	1	1	3	4	4	4	3	2	4
Cavode:											
CaB2	2	2	2	2	3	3	4	2	2	2	4
CaC2	2	2	2	2	3	4	4	4	2	2	4
CaD2	3	2	2	2	3	4	4	4	2	2	4
CdB, CdD	4	3	2	2	2	4	4	4	3	2	4
Chavies: Ce	1	1	1	1	3	4	4	4	1	1	4
Clarksburg-Guernsey:											
CgB	2	1	1	1	3	3	3	3	1	1	3
CgC2	2	1	1	1	3	4	4	4	1	1	4
CgD2	3	2	1	1	3	4	4	4	2	2	4
Clymer:											
ClB2, ClC2	2	1	1	1	2	4	4	4	1	1	4
CmB, CmD	4	3	1	1	3	4	4	4	3	2	4
Cookport:											
CoA	2	1	1	1	3	3	3	3	1	1	3
CoB2	2	1	1	1	3	4	4	3	1	1	3
CoC2	2	1	1	1	3	4	4	4	1	1	4
CpB	4	3	1	1	3	3	4	3	3	2	4
CpD	4	3	1	1	3	4	4	4	3	2	4
Dekalb: DaF, DbB, DbD, DbF	4	3	2	2	2	4	4	4	3	2	4
Elkins: Ek	4	3	3	1	1	1	1	1	3	1	1
Ernest:											
ErA	2	1	1	1	3	3	3	3	1	1	3
ErB2	2	1	1	1	3	4	4	3	1	1	4
ErC2	2	1	1	1	3	4	4	4	1	1	4
EsB	4	3	1	1	3	3	4	3	3	2	4
EsD	4	3	1	1	3	4	4	4	3	2	4

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Series and map symbols	Wildlife habitat elements								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Gilpin:											
GcA, GcB2, GcC2	2	2	2	2	2	4	4	4	2	2	4
GcD2	3	2	2	2	2	4	4	4	2	2	4
GnB, GnD	4	3	2	2	2	4	4	4	3	2	4
GnF	4	4	2	2	2	4	4	4	3	3	4
Gilpin-Weikert: GrF	4	4	2	2	2	4	4	4	3	2	4
Guernsey:											
GsB2	2	1	1	1	3	4	4	3	1	1	4
GsC2	2	1	1	1	3	4	4	4	1	1	4
GsD2, GtC3	3	2	1	1	3	4	4	4	2	2	4
GsE2, GtD3	4	3	1	1	3	4	4	4	3	2	4
Hazleton:											
HaA, HaB2, HaC2	2	1	1	1	2	4	4	4	1	1	4
HaD2	3	2	2	2	2	4	4	4	2	2	4
Library: LbB2	3	3	2	2	2	3	4	2	3	2	4
Lindside: Ln	2	1	1	1	3	3	3	3	1	1	3
Melvin and Newark: Mc	2	1	1	1	3	3	3	3	1	1	3
Monongahela:											
MoA	2	1	1	1	3	3	3	3	1	1	3
MoB2	2	1	1	1	3	4	4	3	1	1	4
MoC2	2	1	1	1	3	4	4	4	1	1	4
Newark. (Mapped only with Melvin soils.)											
Philo: Ph	2	1	1	1	3	3	3	3	1	1	3
Purdy: Pu	3	3	2	2	2	1	1	1	3	2	1
Thorndale:											
ThA	3	3	2	2	2	1	1	1	3	2	1
ThB2	3	3	2	2	2	3	4	1	3	2	3
Tyler: Ty	2	2	2	2	3	2	2	2	2	2	2
Upshur:											
UhB2, UhC2	2	1	1	1	3	4	4	4	1	1	4
UnD2	3	2	1	1	3	4	4	4	2	2	4
UpB, UpD	4	3	1	1	3	4	4	4	3	2	4
UpF	4	4	1	1	3	4	4	4	3	2	4
Westmoreland:											
WcA, WcB, WcC2	2	1	1	1	3	4	4	4	1	1	4
WcD2	3	2	1	1	3	4	4	4	2	1	4
Wharton:											
WrA	2	1	1	1	3	3	3	3	1	1	3
WrB2	2	1	1	1	3	4	4	3	1	1	4
WrC2	2	1	1	1	3	4	4	4	1	1	4
WrD2	3	2	1	1	3	4	4	4	2	2	4
WrE2, WsE	4	3	1	1	3	4	4	4	3	2	4
WsB	4	3	1	1	3	4	4	3	3	2	4

2. Make preliminary estimates of the soil properties that are important in planning agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, pipelines, and airports, and in planning detailed investigations of the intended locations.
4. Locate potential sources of sand, gravel, and other construction material.
5. Correlate performance of pavements with kinds of soils and thus develop information that will be useful in designing future roads and in maintaining present roads.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps, reports, and aerial photographs to make maps and reports that can readily be used by engineers.
8. Estimate the nature of the material that will be encountered when excavating for buildings and other structures.
9. Determine the suitability of soils as sites for the infiltration of waste from septic fields.

Used with the soil map to identify the soils, the engineering interpretations reported here can be useful for many purposes. It should be emphasized, however, that these interpretations do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy leads and at sites where excavations are deeper than the depths of the layers here reported. Also, engineers and others should not apply specific values to the estimated values given for bearing capacity of soils. The soil map is nevertheless useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used by the agricultural soil scientists may be unfamiliar to the engineer, and some terms may have special meaning in soil science. These and other special terms are defined in the Glossary in the back part of this publication.

Not all of the soil information related to engineering can be obtained in this subsection on engineering. In some instances it is necessary to refer to other parts of the survey, particularly to the section "Descriptions of the Soils," "Use and Management of the Soils," and "Formation and Classification of Soils."

Much of the information in this subsection is in tables. Table 4 gives engineering test data obtained on samples of soils representative of soil series in the county. In table 5 are estimates of the engineering properties of the soils. In table 6 are engineering interpretations of these properties.

Engineering classification systems

The two systems most commonly used in classifying samples of soil horizons for engineering are the AASHO system, adopted by the American Association of State Highway Officials, and the Unified Soil Classification System.

The AASHO system is used to classify soils according to those properties that affect use in highway construction (*2*). In this system a soil is placed in one of seven basic groups. The groups range from A–1 through A–7, and the soils are placed in each group on the basis of grain-size distribution, liquid limit, and plasticity index. In group A–1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation) and, in group 7 are clay soils that have low strength when wet. The best soils for subgrade are therefore classified as A–1, the next best A–2, and so on to class A–7, the poorest soils for subgrade. Within each group the relative engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. The AASHO classification for tested soils, with index numbers in parentheses, is shown in table 4. The estimated classification for all soils mapped in the county is given in table 5.

The Unified system classifies soils according to particle-size distribution, plasticity, liquid limit, and organic matter (*20*). Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt.

Engineering test data

Table 4 contains the results of engineering tests performed by the Pennsylvania Department of Transportation on several important soils in Fayette County. The table shows the specific location where samples were taken, the depth to which sampling was done, and the results of tests to determine particle-size distribution and other properties significant in soil engineering.

Maximum dry density is the maximum unit dry weight of the soil when it has been compacted with optimum moisture by the prescribed method of compaction. The moisture content that gives the highest dry unit weight is called the *optimum moisture* content for the specific method of compaction.

Mechanical analyses show the percentages, by weight, of soil particles that would pass sieves of specified sizes. Sand and other coarser materials do not pass through the No. 200 sieve. Silt and clay pass through the No. 200 sieve. Silt is that material larger than 0.002 millimeter in diameter that passes through the No. 200 sieve, and clay is that fraction passing through the No. 200 sieve that is smaller than 0.002 millimeter in diameter. The clay fraction was determined by the hydrometer method, rather than the pipette method that most scientists use in determining the clay in soil samples.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a solid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic. The liquid limit is the moisture content at which the material changes from a plastic to a liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

TABLE 4.—*Engineering*

Soil name and location	Parent material	Pennsylvania report number	Depth	Moisture-density [2]	
				Maximum dry density	Optimum moisture
		BM–	*Inches*	*Lb. per cu. ft.*	*Percent*
Albrights silt loam:					
Stewart Township: ½ mile N. of Nicolay and ½ mile W. of Somerset County line (Modal profile).	Colluvial material of gravel, sand, silt, and clay from soils of the uplands that were derived from sandstone, limestone, and calcareous, gray clay shale.	46191	10–27	108	18
		46192	27–50	121	13
Stewart Township: 1.5 miles N. of Nicolay (Coarser textured than modal profile).	Colluvial material of gravel, sand, silt, and clay from soils of the uplands that were derived from sandstone, limestone, and calcareous, gray clay shale.	46195	15–26	116	15
		46194	26–36	116	15
Andover very stony loam:					
Georges Township: 1 mile NE. of Fairchance in Askon Hollow (Modal profile).	Colluvial material of gravel, sand, and some clay.	46353	10–25	121	12
		46354	42–88	126	12
Georges Township: 1.5 miles E. of Haydentown (Finer textured than modal profile).	Colluvial material of gravel, sand, silt, and clay.	46181	8–17	108	16
		46182	25–43	---	---
Springhill Township: 1 mile SE. of White House on N. side of L. R. 26057 (Coarser textured than modal profile).	Colluvial material of gravel, sand, and some clay.	46161	12–22	122	12
		46162	23–36	119	14
Armagh silt loam:					
Henry Clay Township: 0.5 mile S. of Markleysburg (Modal profile).	Residual soil material from acid clay shale.	46187	9–19	98	23
		46188	26–37	98	24
Brinkerton silt loam:					
Franklin Township: 1 mile SW. of Flatwoods (Modal profile).	Colluvial soil material of sand, silt, and clay that were derived from sandstone and acid, gray shale on uplands.	46183	21–29	112	16
		46184	29–47	113	16
Chavies fine sandy loam:					
Henry Clay Township: 1.5 miles N. of Confluence at intersection of the Youghiogheny River and State Route 281 (Modal profile).	Alluvial soil material from sand, silt, and some clay derived from acid sandstone, siltstone, and some shale.	29836	21–32	124	12
		29837	49–64	121	12
Georges Township: 1 mile NE. of Rubles Mill (Coarser textured than modal profile).	Sand, silt, and clay soil material on terraces.	43871	10–18	114	16
		43872	18–27	117	14
Clarksburg silt loam:					
Georges Township: 1 mile E. of Collier (Modal profile).	Colluvium from calcareous soils derived from gray clay shale, limestone, and sandstone on uplands.	42830	18–37	111	16
		42831	37–56	120	13
Georges Township: 1 mile E. of Collier (Coarser textured than modal profile).	Colluvium from calcareous soils derived from gray clay shale, limestone, and sandstone.	42826	7–26	113	15
		42827	26–54	119	13
Dekalb very stony sandy loam:					
Stewart Township: 1½ miles SW. of Ohiopyle (Coarser textured than modal profile).	Residuum from acid, coarse conglomeratic sandstone that is grayish white and reddish.	46173	7–23	126	10
		46174	25–35	120	12
Guernsey silt loam:					
Springhill Township: 1 mile NE. of New Geneva (Modal profile).	Residuum from calcareous, gray shale, limestone, and sandstone.	42832	22–37	116	15
		42833	49–60	112	15

See footnotes at end of table.

test data [1]

Mechanical analysis [3]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	*Percent*			
100	98	95	93	89	68	67	58	41	33	40	14	A–6(6)	ML–CL
100	98	95	89	80	49	48	41	26	19	27	7	A–4(3)	SM–SC
------	100	97	95	87	63	61	53	35	28	32	10	A–4(6)	ML–CL
------	100	99	98	91	71	69	59	37	29	33	10	A–4(7)	ML–CL
100	87	82	78	71	45	42	32	18	15	24	5	A–4(2)	SM–SC
100	86	85	68	55	31	48	20	12	9	20	2	A–2–4(0)	SM
100	93	90	88	83	73	71	61	36	25	31	6	A–4(8)	ML
100	93	85	79	71	52	49	37	20	14	25	5	A–4(3)	ML–CL
100	97	89	81	66	42	40	32	20	15	27	7	A–4(1)	SM–SC
100	93	79	73	62	36	34	36	17	12	27	6	A–4(0)	SM–SC
------	------	--------	100	94	88	88	76	48	36	46	13	A–7–5(10)	ML
------	------	--------	--------	99	96	95	85	55	41	49	18	A–7–5(13)	ML
------	------	100	99	98	89	86	69	45	35	39	19	A–6(12)	CL
------	------	100	99	95	79	85	59	39	29	36	15	A–6(10)	ML–CL
------	------	--------	100	98	37	33	25	19	15	18	0	A–4(0)	SM
------	------	--------	100	94	36	31	22	14	10	18	0	A–4(0)	SM
------	------	--------	100	96	64	62	55	40	33	33	12	A–6(7)	ML–CL
------	------	--------	--------	95	51	49	43	31	26	30	11	A–6(4)	CL
------	100	95	89	79	63	61	51	31	23	35	11	A–6(6)	ML–CL
------	100	94	86	72	51	49	42	34	19	30	19	A–4(3)	ML–CL
------	100	91	86	77	64	62	54	35	28	37	12	A–6(7)	ML–CL
------	100	97	91	70	47	45	37	23	17	28	7	A–4(2)	SM–SC
100	97	94	88	56	30	28	22	15	10	22	5	A–2–4(0)	SM
100	51	87	81	58	38	36	31	20	14	27	5	A–4(1)	SM–SC
100	93	86	81	74	52	51	43	28	23	34	12	A–6(4)	ML–CL
------	100	98	97	94	84	82	70	47	35	39	13	A–6(9)	ML–CL

TABLE 4.—*Engineering*

Soil name and location	Parent material	Pennsylvania report number	Depth	Moisture-density [2] Maximum dry density	Moisture-density [2] Optimum moisture
Hazleton channery loam:		*BM–*	*Inches*	*Lb. per cu. ft.*	*Percent*
Stewart Township: 5½ miles east-northeast of Ohiopyle (Modal profile).	Residual soil materials derived from acid sandstone (gray bedded sandstone of Pocono group).	29834 29835	11–18 39–50	122 122	11 12
Wharton Township: 3 miles NW. of Elliottsville (Finer textured than modal profile).	Residuum from acid, gray clay shale.	46157 46158	9–19 19–28	120 122	12 12
Dunbar Township: 3 miles SW. of Leisenring (Coarser textured than modal profile).	Residuum from Graywacke sandstone that is micaceous, argillaceous or both.	43855 43856	7–19 19–30	107 110	16 14
Library silty clay loam:					
Georges Township: 1 mile N. of Smithfield (Modal profile).	Residuum from interbedded, calcareous, gray clay shale and limestone.	43862 43663	9–13 16–26	101 108	23 18
Springhill Township: 1 mile N. of Gann (Finer textured than modal profile).	Residuum from interbedded, calcareous, gray shale and limestone.	46165 46166	10–16 16–29	103 107	18 18
Lindside silt loam:					
Menallen Township: 1.5 miles NW. of Uniontown (Modal profile).	Alluvium from soils derived from gray clay shale, sandstone, and limestone on uplands.	42836 42837	8–24 36–52	103 113	17 16
Redstone Township: 0.25 mile SW. of Newboro (Finer textured than modal profile).	Alluvium from soils derived from gray clay shale, sandstone, and limestone on uplands.	42836 42837	8–24 36–52	103 113	17 16
Melvin silt loam:					
Menallen Township: 0.25 mile E. of New Salem (Modal profile).	Alluvium from soils derived from gray clay shale, sandstone, and limestone.	42834 42835	24–39 46–78	106 111	19 17
Franklin Township: 2 miles N. of Waltersburg (Finer textured than modal profile).	Alluvium from soils derived from shale, limestone, and sandstone on uplands.	43875 43857	7–18 25–34	99 100	22 21
Dunbar Township: 1 mile NE. of Bute (Coarser textured than modal profile).	Alluvium from soils derived from shale, limestone, and sandstone on uplands.	43860 43861	8–18 18–29	109 112	17 16
Monongahela silt loam:					
Jefferson Township: 1 mile E. of Lowder and 2 miles W. of Star Junction (Modal profile).	Stratified sand, silt, colloidal clay, and gravel from old river deposits.	46169 46170	19–32 32–44	116 109	14 18
Springhill Township: 3 miles N. of Point Marion (Finer textured than modal profile).	Stratified sand, silt, colloidal clay, and gravel from old river deposits.	42828 42829	9–20 25–40	111 112	15 16
Perry Township: 0.5 mile W. of Perryopolis (Coarser textured than modal profile).	Stratified sand, silt, colloidal clay, and gravel from old river deposits.	46355 46356	16–28 28–44	116 115	14 14

See footnotes at end of table.

test data [1]—Continued

Mechanical analysis [3]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
										Percent			
100	89	84	81	79	33	31	26	19	14	20	0	A-2-4(0)	SM
100	85	81	76	65	34	31	25	20	16	28	4	A-2-4(0)	SM-SC
100	83	77	74	70	33	32	28	19	13	18	0	A-2-4(0)	SM
100	71	58	54	49	23	22	18	11	9	21	1	A-1-b(0)	GM
100	99	88	86	71	37	35	28	13	7	33	3	A-4(0)	SM
100	96	77	73	60	30	29	23	11	6	32	2	A-2-4(0)	SM
------	------	100	99	98	96	96	90	68	59	62	31	A-7-5(20)	MH-CH
------	100	99	98	95	93	93	82	52	44	47	20	A-7-6(13)	ML-CL
------	------	------	100	97	93	92	85	62	49	47	19	A-7-6(13)	ML-CL
------	------	------	100	98	94	93	86	64	53	47	22	A-7-6(14)	ML-CL
------	------	------	100	99	86	83	67	35	22	39	11	A-6(8)	ML
------	100	99	99	92	40	37	29	19	14	27	5	A-4(1)	SM-SC
------	------	------	100	98	70	65	48	27	17	31	3	A-4(7)	ML
------	------	------	100	100	77	72	55	34	26	30	9	A-4(8)	ML-CL
------	------	100	99	97	82	78	61	39	27	41	13	A-7-6(9)	ML
------	100	99	98	96	69	65	52	34	26	34	10	A-6(9)	ML-CL
------	------	100	99	98	89	87	72	42	29	45	15	A-7-5(11)	ML
------	------	------	100	98	75	72	58	35	25	39	13	A-6(9)	ML-CL
------	100	99	98	91	67	63	49	24	15	31	6	A-4(6)	ML
------	------	100	99	95	67	63	49	27	19	32	7	A-4(6)	ML-CL
------	------	------	------	100	66	61	49	31	24	28	9	A-4(6)	CL
------	------	------	------	100	90	87	72	50	38	38	15	A-(10)	CL
------	------	------	100	97	90	88	73	41	31	35	11	A-6(8)	ML-CL, ML
------	------	------	100	98	88	86	70	38	28	34	12	A-6(9)	ML-CL, CL
------	100	98	98	95	76	74	62	36	27	30	10	A-4(8)	CL
------	100	99	98	96	75	72	60	38	30	30	10	A-4(8)	CL

TABLE 4.—*Engineering*

Soil name and location	Parent material	Pennsylvania report number	Depth	Moisture-density [2]	
				Maximum dry density	Optimum moisture
		BM–	*Inches*	*Lb. per cu. ft.*	*Percent*
Purdy silt loam:					
Perry Township: In Perryopolis, turn N. off Liberty St. at Swartz Lane (Modal profile).	Acid lacustrine sediments derived from acid, gray shale and sandstone (Carmichaels).	29822 29823	25–32 50–55	107 121	18 12
Henry Clay Township: 8 miles E. of Uniontown, at intersection of U.S. Highway No. 40 and L.R. 26065 (Finer textured profile than modal profile).	Acid lacustrine sediments derived from acid, gray shale and sandstone.	29840 29841	27–39 45–53	100 117	21 14
Washington Township: 0.25 mile W. of Washington Heights (Coarser textured than modal profile).	Lacustrine soil material of sand, silt, and clay.	43867 43868	10–22 28–36	113 111	16 18
Tyler silt loam:					
Dunbar Township: 2 miles W. of Connelsville from intersection of State Route 711 and L.R. 26093 (Modal profile).	Acid lacustrine sediments derived from acid, gray shale and sandstone (Carmichaels).	29826 29827	18–25 36–45	113 123	16 13
Perry Township: 0.5 mile N. of Perryopolis, Lynn subdivision (Finer textured than modal profile).	Acid lacustrine soil material of sand, silt, clay, and small pebbles.	45190 43866	15–27 33–43	107 114	17 14
Georges Township: 36 Sheldon Ave., Fairchance Borough (Coarser textured than modal profile).	Lacustrine soil material of sand, silt, clay, and gravel.	43864 43865	21–33 41–48	110 118	16 13
Upshur silt loam:					
Springhill Township: 2.5 miles SE. of White House on N. side of L.R. 26057 (Modal profile).	Residual material derived from interbedded calcareous and greenish-gray shale and limestone.	46163 46164	14–22 26–42	108 116	17 15
Georges Township: 5 miles SE. of Haydentown at roadcut (Finer textured than modal profile).	Residual material derived from acid, red shale, and siltstone.	43869 43870	14–24 29–45	111 123	18 12
Stewart Township: 3 miles SE. of Ohiopyle (Coarser textured than modal profile).	Residual material derived from calcareous red clay, shale, and limestone at lower depths.	46175 46176	15–25 25–38	113 102	18 21
Westmoreland channery silt loam:					
German Township: 0.5 mile W. of New Salem (Modal profile).	Interbedded sandstone, limestone, and calcareous, gray clay shale.	42024 42025	14–19 29–40	118 117	14 14
Wharton silt loam:					
Springfield Township: 0.75 mile S. of Mill Run on W. side of State Route 381 (Modal profile).	Residual soil materials derived from acid, gray shale of the Conemaugh group, probably the Upper Mahoning fire clays.	29832 29833	13–19 36–42	107 118	19 14
Wharton Township: 1.5 miles N. of Elliotsville (Finer textured than modal profile).	Residuum from acid, gray shale.	46159 46160	7–24 40–64	104 103	20 21

[1] Tests performed by the Pennsylvania Department of Transportation Soil Testing Laboratory, Harrisburg, Pennsylvania, in accordance with standard procedures of the American Association of State Highway Officials (AASHO).

[2] Based on Moisture-Density Relations of Soils Using 5.5-lb. Rammer and 12-in. Drop, AASHO Designation T 99, Method A.

[3] Mechanical analyses according to the AASHO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed

test data [1]—Continued

Mechanical analysis [3]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
										Percent			
------	------	------	100	99	95	94	78	52	42	42	17	A-7-6(11)	ML-CL
------	------	------	100	99	86	84	65	40	30	24	5	A-4(8)	ML-CL
------	------	------	100	99	91	87	75	47	37	47	17	A-7-5(12)	ML
------	100	95	90	86	74	40	53	30	23	30	15	A-4(8)	ML
------	------	100	98	90	72	71	60	36	26	32	10	A-4(7)	ML-CL
------	------	------	100	97	85	84	75	51	44	47	13	A-7-6(15)	CL
------	------	------	100	96	74	71	58	35	25	32	10	A-4(8)	ML-CL
------	100	95	80	55	31	29	24	16	12	31	8	A-2-4(0)	SM-SC
------	------	------	100	97	87	85	71	45	33	34	11	A-6(8)	ML-CL
------	------	100	99	95	76	74	62	39	29	31	10	A-4(8)	ML-CL
------	------	------	100	98	74	71	61	38	32	34	12	A-6(9)	ML-CL
------	100	96	95	93	59	56	45	27	23	26	8	A-4(5)	CL
------	------	100	98	95	84	82	74	53	45	46	22	A-7-6(14)	CL
------	100	90	60	45	34	33	27	22	19	41	16	A-2-7(1)	SC
------	------	------	------	100	98	97	85	56	42	42	15	A-7-6(10)	ML-CL
------	------	------	100	98	91	90	75	40	24	32	8	A-4(8)	ML-CL
------	------	------	100	98	73	71	63	48	40	39	16	A-6(10)	ML-CL
------	------	------	100	99	86	85	77	62	54	49	21	A-7-6(14)	ML-CL
100	97	93	86	78	61	58	49	29	23	32	8	A-4(5)	ML-CL
------	100	98	95	91	74	70	55	34	27	33	10	A-4(8)	ML-CL
------	100	99	98	92	86	85	76	59	48	50	20	A-7-5(14)	ML-CL
100	96	92	89	97	83	82	73	50	37	40	14	A-6(10)	ML-CL
------	100	97	94	88	84	83	73	51	40	50	20	A-7-5(14)	ML-CL
------	100	98	97	91	85	84	77	63	50	53	22	A-7-5(15)	MH

by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

[4] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation M 145-49.

[5] Based on the Unified Soil Classification System (*20*). SCS and Bureau of Public Roads (BPR) have agreed to consider that all soils having plasticity indexes within 2 points of A-line are to be given a borderline classification. An example of a borderline classification obtained by this use is ML-CL.

419-059—73——3

TABLE 5.—*Estimated engineering*

[Properties were not determined for Mine dumps (Md); Rubble land (Ru); Strip *mine* spoil

Soil series and map symbols	Depth to— Seasonal high water table	Depth to— Bedrock	Depth from surface	Coarse fraction greater than 3 inches	Percentage passing seive— No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Classification— Unified	AASHO
	Feet	*Feet*	*Inches*	*Percent*						
Albrights: AbB2, AcB	1–3	4–7	0–7	0–5	80–100	75–100	60–95	50–85	ML, CL	A–4
			7–27	0–15	80–100	70–100	60–95	50–80	ML, CL	A–4, A–6
			27–50	0–15	70–100	65–100	55–95	30–70	ML, CL, SM–SC	A–2, A–4
Allegheny: AlB2, AlC2	3+	5–12+	0–8	--------	80–100	70–100	50–100	30–80	ML, SM	A–2, A–4
			8–38	--------	80–100	70–90	70–85	60–80	ML	A–4
			38–60	--------	75–90	65–75	60–70	45–65	ML, SM	A–4
Andover: AnB	0–½	6–12	0–8	0–5	80–90	50–90	50–85	45–75	ML, SM	A–4
			8–42	0–10	80–90	50–85	50–80	40–75	SM–SC, ML	A–4
			42–88	5–15	70–85	45–80	45–70	30–55	SM, ML, CL, SM–SC	A–2, A–4
Armagh (Mapped only in an undifferentiated group with Brinkerton soils.)	0–½	3½–6	0–9	0–5	95–100	90–100	80–95	75–90	ML	A–4, A–6
			9–26	0–5	90–100	90–100	90–100	70–90	ML, CL	A–6, A–7
			26–60	0–5	100	100	95–100	90–100	ML, CL	A–7
Atkins: At	0	4–15+	0–7	--------	90–100	90–100	85–100	60–95	ML, CL	A–4, A–6
			7–16	--------	90–100	90–100	90–95	70–80	ML, CL	A–4
			16–42	--------	90–100	90–100	70–80	60–70	ML, CL	A–4, A–7
Brinkerton: BaA, BaB (For properties of the Armagh soils in these mapping units, see the Armagh series.)	0–½	5–12	0–8	0–5	90–100	85–100	85–100	75–100	ML, CL	A–4, A–6
			8–29	0–10	90–100	85–100	85–100	75–95	ML, CL	A–6, A–7
			29–50	0–15	75–100	70–100	60–100	60–95	ML, CL	A–6, A–7
Brooke: BrB2, BrC2, BrD2	3+	2–3½	0–8	--------	95–100	90–100	90–100	85–100	MH, CL, CH	A–6, A–7
			8–34	--------	90–100	75–100	75–100	70–100	MH, CH	A–7
			34–37	0–5	85–100	75–100	70–100	65–100	CH, MH	A–6, A–7
			37	--------	--------	--------	--------	--------	--------	--------
Buchanan: BuB, BuD	1½–3	5+	0–10	0–5	65–100	60–85	55–70	30–60	ML, SM, GM	A–2, A–4
			10–27	0–15	65–95	60–80	55–65	40–50	SM-SC, SC, GM	A–4
			27–42	0–15	60–85	60–70	50–60	30–40	SM-SC, SC, GM	A–2, A–4
Cavode: CaB2, CaC2, CaD2, CdB, CdD.	½–1½	3½–6	0–7	0–5	95–100	90–100	85–95	80–90	ML, CL	A–4, A–6
			7–23	0–5	95–100	85–95	85–95	75–85	ML, CL	A–7
			23–60	0–5	85–100	75–85	70–80	60–70	ML, CL	A–7
Chavies: Ce	3+	5–12	0–9	--------	95–100	80–100	70–100	40–70	SM, ML	A–4
			9–58	--------	95–100	50–100	40–100	35–75	SM-SC, SM, ML, CL	A–4, A–6
			58–72	0–5	60–100	30–100	30–95	20–50	SM	A–2, A–4, A–6
Clarksburg: CgB, CgC2, CgD2 (For the properties of the Guernsey soils in these mapping units, see the Guernsey series).	1–3	4–10	0–10	0–5	80–100	75–95	70–90	50–85	ML	A–4
			10–37	0–10	80–100	80–95	70–90	50–80	ML, CL	A–6
			37–66	0–10	80–100	80–95	70–90	45–80	ML, CL, SM-SC	A–4

properties of the soils

(SmB; SmD: SmF; SnB; SnD; SnF); and Urban land (UrB; UrD) because of their variability]

Classification—Continued							Corrosion potential	
Dominant USDA texture	Permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential	Steel	Concrete
	Inches per hour	*Inches per inch of soil*	*pH*	*Percent*	*Pounds per cubic foot*			
Silt loam	0. 63–2. 0	0. 16–0. 20	5. 1–6. 0			Low	High	Moderate.
Gravelly clay loam	0. 2–0. 63	0. 08–0. 14	5. 1–5. 5	13–15	110–120	Low	High	Moderate.
Gravelly loam (fragipan)	0. 2–0. 63	0. 03–0. 06	5. 5–6. 0	10–12	120–125	Low	High	Moderate.
Fine sandy loam	2. 0–6. 3	0. 10–0. 14	4. 5–5. 5			Low	Low	High.
Fine sandy loam and loam	0. 63–2. 0	0. 08–0. 12	4. 5–5. 5	15–17	105–110	Low	Low	High.
Loam	2. 0–6. 3	0. 05–0. 10	4. 5–5. 5	8–10	110–125	Low	Low	High.
Loam, cobbly loam	2. 0–6. 3	0. 12–0. 16	4. 5–5. 5			Low	High	High.
Loam, cobbly sandy clay loam, gravelly fine sandy loam, (fragipan).	<0. 2	0. 08–0. 14	4. 0–5. 0	12–14	116–122	Low	High	High.
Gravelly sandy loam (fragipan).	0. 2–0. 63	0. 08–0. 12	4. 0–5. 0	12–14	120–125	Low	High	High.
Silt loam	0. 63–2. 0	0. 16–0. 20	4. 5–5. 5			Low	High	High.
Silty clay loam	0. 2–0. 63	0. 12–0. 16	5. 0–6. 0	18–20	105–110	Moderate	High	High.
Silty clay	<0. 2	0. 06–0. 12	4. 5–5. 5	18–20	105–110	Moderate	High	High.
Silt loam	0. 63–2. 0	0. 16–0. 20	5. 1–5. 5			Low	High	High.
Sandy clay loam	0. 63–2. 0	0. 10–0. 14	5. 1–5. 5	16–18	105–110	Moderate	High	High.
Silt loam, loam	0. 63–2. 0	0. 06–0. 12	4. 5–5. 5	16–18	105–110	Low	High	High.
Silt loam	0. 63–2. 0	0. 18–0. 24	4. 5–6. 0			Low	High	High.
Silty clay loam	0. 2–0. 63	0. 12–0. 18	4. 5–5. 5	16–18	110–115	Moderate	High	High.
Clay loam (fragipan)	<0. 2	0. 10–0. 12	5. 1–6. 0	15–17	110–115	Moderate	High	High.
Silty clay loam	0. 63–2. 0	0. 16–0. 20	6. 1–7. 2			Moderate	Low	Low.
Silty clay and channery silty clay.	<0. 2	0. 10–0. 14	6. 6–7. 8	22–24	94–100	High	Low	Low.
Channery silty clay	<0. 2	0. 06–0. 10	6. 6–7. 8	18–22	95–105	High	Low	Low.
Limestone and calcareous shale.								
Loam, gravelly fine sandy loam.	2. 0–6. 3	0. 12–0. 18	4. 2–5. 5			Low	Moderate	High.
Channery loam	0. 63–2. 0	0. 08–0. 14	4. 5–5. 5	12–14	115–120	Low	Moderate	High.
Channery loam (fragipan)	<0. 2	0. 06–0. 10	4. 5–5. 5	10–12	120–125	Low	Moderate	High.
Silt loam	0. 63–2. 0	0. 14–0. 18	4. 8–5. 5			Low	High	High.
Silty clay loam and silty clay	<0. 2	0. 08–0. 14	4. 5–5. 5	15–18	104–106	Moderate	High	High.
Silty clay	<0. 2	0. 06–0. 12	4. 0–5. 5	15–18	104–106	Moderate	High	High.
Fine sandy loam	2. 0–6. 3	0. 08–0. 14	5. 1–6. 0			Low	Low	Moderate.
Fine sandy loam, very fine sandy loam, silt loam, loam.	2. 0–6. 3	0. 08–0. 14	5. 1–6. 0	10–12	115–120	Low	Low	Moderate.
Fine sandy loam, very gravelly loam, sandy loam.	2. 0–6. 3	0. 06–0. 10	5. 1–6. 0	10 12	115 120	Low	Low	Moderate.
Silt loam	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5			Low	Moderate	High.
Clay loam, loam	<0. 2	0. 08–0. 18	5. 1–6. 5	16–18	110–115	Low to moderate.	High	Moderate.
Loam (fragipan)	<0. 2	0. 06–0. 10	5. 5–6. 5	15–18	112–115	Low to moderate.	High	Moderate.

TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to—		Depth from surface	Coarse fraction greater than 3 inches	Percentage passing seive—				Classification	
	Seasonal high water table	Bedrock			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Unified	AASHO
	Feet	*Feet*	*Inches*	*Percent*						
Clymer: ClB2, ClC2, CmB, CmD.	3+	3½–7	0–7	0–10	60–85	55–80	50–75	30–55	GM, GC, ML	A–2, A–4
			7–32	0–10	60–80	55–80	50–75	30–40	GM-GC, GM	A–2, A–4
			32–60	10–25	40–70	35–65	35–45	10–20	GW-GM, GM-GC, SM-SC	A–2
			60	--------	--------	--------	--------	--------	--------	--------
Cookport: CoA, CoB2, CoC2, CpB, CpD.	1½–3	3½–5	0–7	0–10	80–100	75–95	60–80	40–70	ML, SM	A–4
			7–25	0–10	80–100	75–95	60–80	40–65	ML, CL, SM	A–4
			25–49	0–15	75–85	70–85	60–80	40–55	ML, CL, SC	A–4
			49	--------	--------	--------	--------	--------	--------	--------
Dekalb: DaF, DbB, DbD, DbF.	3+	2–3½	0–8	10–20	60–95	50–90	40–80	20–55	SM, GM, ML	A–2, A–4
			8–34	10–40	60–95	40–90	40–80	15–40	GM, SM, SM-SC	A–1, A–2, A–4
			34	--------	--------	--------	--------	--------	--------	--------
Elkins: Ek	0	5–15	0–9	--------	95–100	95–100	90–95	75–90	ML, CL, OL	A–4, A–6
			9–38	--------	95–100	95–100	90–95	75–85	ML, CL	A–4, A–6
			38–60	--------	95–100	95–100	85–90	75–80	ML, CL	A–4, A–6
Ernest: ErA, ErB2, ErC2, EsB, EsD.	1½–3	4–20+	0–9	0–15	75–100	70–100	70–95	60–95	ML, CL	A–4, A–6
			9–40	0–15	75–100	75–100	70–95	60–95	ML, CL	A–4, A–6
			40–48	5–20	70–95	60–90	50–80	40–70	ML, CL, GM	A–4, A–6
Gilpin: GcA, GcB2, GcC2, GcD2, GnB, GnD, GnF, GrF. (For properties of the Weikert soils in the unit GrF, see the Weikert series.)	3+	2–3½	0–7	--------	85–100	75–90	70–85	60–85	ML	A–4
			7–20	--------	70–90	65–85	60–75	50–70	ML, CL	A–4
			20–31	--------	55–70	35–65	30–55	25–50	GM-GC	A–4, A–2
			31	--------	--------	--------	--------	--------	--------	--------
Guernsey: GsB2, GsC2, GsD2, GsE2, GtC3, GtD3.	1½–3	3½–7	0–9	--------	85–100	85–100	85–95	80–90	ML, CL	A–4, A–6
			9–37	--------	80–100	80–100	70–90	50–80	ML, CL	A–6
			37–72	--------	80–100	75–100	75–95	70–95	ML, CL	A–6, A–7
			72	--------	--------	--------	--------	--------	--------	--------
Hazleton: HaA, HaB2, HaC2, HaD2.	3+	3½–5	0–11	--------	70–95	70–95	55–90	40–55	ML, SM	A–4
			11–31	0–10	60–95	50–90	40–80	15–35	GM, SM	A–1, A–2
			31–59	0–10	45–85	30–85	25–80	15–35	GP-GM, SM-SC, SM	A–1, A–2
			59	--------	--------	--------	--------	--------	--------	--------
Library: LbB2	½–1½	3½–6	0–9	--------	95–100	90–100	85–100	80–100	ML, CL	A–6, A–7
			9–16	--------	95–100	95–100	95–100	80–100	MH, CH, ML, CL	A–7
			16–44	--------	95–100	90–100	90–100	80–95	ML, CL	A–6, A–7
			44	--------	--------	--------	--------	--------	--------	--------

properties of the soils—Continued

Classification—Continued: Dominant USDA texture	Permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential	Corrosion potential: Steel	Corrosion potential: Concrete
	Inches per hour	*Inches per inch of soil*	*pH*	*Percent*	*Pounds per cubic foot*			
Channery loam	2. 0–6. 3	0. 08–0. 12	4. 5–6. 0			Low	Low	High.
Channery loam	2. 0–6. 3	0. 06–0. 10	4. 5–5. 5	12–15	118–120	Low	Low	High.
Channery sandy loam, very channery sandy loam.	2. 0–6. 3	0. 04–0. 08	4. 5–5. 5	11–14	118–122	Low	Low	High.
Thin-bedded sandstone.								
Loam	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5			Low	Moderate	High.
Silty clay loam	0. 63–2. 0	0. 06–0. 12	4. 5–5. 5	13–15	113–118	Low	Moderate	High.
Clay loam, sandy clay loam, very channery sandy clay loam (fragipan).	<0. 2	0. 04–0. 08	4. 5–5. 5	11–13	117–122	Low	Moderate	High.
Thin-bedded sandstone.								
Sandy loam	2. 0–6. 3	0. 06–0. 10	4. 5–5. 0			Low	Low	High.
Channery loam, very channery sandy loam.	>6. 3	0. 03–0. 06	4. 5–5. 0	10–12	120–125	Low	Low	High.
Sandstone.								
Silt loam	0. 63–2. 0	0. 16–0. 20	4. 5–5. 5			Low	High	High.
Silty clay loam	<0. 2	0. 12–0. 16	4. 5–5. 5	19–21	108–110	Moderate	High	High.
Clay loam	<0. 2	0. 12–0. 16	4. 5–5. 5	18–20	105–108	Moderate	High	High.
Silt loam	0. 63–6. 3	0. 12–0. 18	5. 1–6. 5			Low	Moderate	Moderate.
Silty clay loam (fragipan)	0. 63–2. 0	0. 12–0. 16	4. 5–5. 5	16–18	100–110	Moderate	Moderate	High.
Channery silty clay loam	0. 2–0. 63	0. 08–0. 12	4. 5–5. 5	13–15	115–120	Moderate	Moderate	High.
Channery silt loam	2. 0–6. 3	0. 10–0. 14	4. 5–5. 5			Low	Low	High.
Silty clay loam, channery silty clay loam.	0. 63–2. 0	0. 08–0. 12	4. 5–5. 5	13–15	114–116	Low	Low	High.
Very channery loam	0. 63–2. 0	0. 06–0. 10	4. 5–5. 5	12–14	114–119	Low	Low	High.
Sandstone.								
Silt loam	0. 63–2. 0	0. 14–0. 18	5. 1–6. 0			Low	Moderate	Moderate.
Silty clay loam, channery silty clay loam.	<0. 2	0. 08–0. 14	5. 1–6. 5	16–20	106–110	Moderate	High	High.
Silty clay loam, silty clay, shaly silty clay.	<0. 2	0. 08–0. 14	5. 1–6. 5	16–20	106–110	Moderate	High	High.
Shale.								
Channery loam	2. 0–6. 3	0. 12–0. 16	4. 5–6. 5			Low	Low	High.
Channery loam, channery sandy loam.	2. 0–6. 3	0. 08–0. 12	4. 5–6. 0	10–12	120–123	Low	Low	High.
Very channery sandy loam, very channery loamy sand.	2. 0–6. 3	0. 08–0. 12	4. 5–6. 0	10–12	120–125	Low	Low	High.
Sandstone.								
Silty clay loam	0. 63–2. 0	0. 14–0. 18	5. 1–7. 2			Moderate	High	Moderate
Clay	<0. 2	0. 06–0. 10	5. 6–7. 2	20–22	95–105	Moderate	High	Moderate.
Silty clay, shaly silty clay loam.	<0. 2	0. 06–0. 10	6. 6–7. 2	18 20	100–110	Moderate	High	Low.
Shale								

TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to—		Depth from surface	Coarse fraction greater than 3 inches	Percentage passing seive—				Classification	
	Seasonal high water table	Bedrock			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Unified	AASHO
	Feet	*Feet*	*Inches*	*Percent*						
Lindside: Ln	1½–3	5–15+	0–8	--------	95–100	95–100	90–100	70–90	ML, CL	A–4, A–6
			8–26	--------	90–100	90–100	85–100	70–90	ML, CL	A–4, A–6
			26–60	--------	90–100	80–100	75–100	40–80	SM-SC, ML, CL	A–4
Melvin: Mc (For properties of the Newark soil in this mapping unit, see the Newark series.)	0–½	4–15+	0–9	--------	95–100	90–100	90–100	65–90	ML, CL	A–4, A–6
			9–46	--------	95–100	90–100	90–100	65–90	ML, CL	A–7, A–4
			46–78	--------	95–100	95–100	90–100	65–85	ML, CL	A–4, A–6
Monongahela: MoA, MoB2, MoC2.	1½–3	5–15+	0–7	--------	90–100	90–100	90–100	70–100	ML	A–4
			7–44	0–10	90–100	90–100	90–100	65–90	ML, CL	A–4, A–6
			44–80	5–15	90–100	90–100	85–100	40–90	ML, CL, SM, SC	A–4, A–6
Newark (Mapped only in undifferentiated group with Melvin soils.)	½–1½	5–15+	0–8	--------	100	95–100	90–100	70–90	ML, CL	A–4, A–6
			8–37	--------	95–100	95–100	85–100	70–90	ML, CL	A–6, A–4
			37–51	0–20	95–100	95–100	80–100	60–80	ML, CL	A–4, A–6
			51–72	--------	--------	--------	--------	--------	--------	--------
Philo: Ph	1½–3	5–15+	0–8	--------	95–100	95–100	80–95	60–75	ML, CL	A–4
			8–28	--------	95–100	95–100	80–95	60–75	ML, CL	A–4
			28–50	--------	75–85	70–80	65–75	45–60	SC, ML, CL	A–4, A–6
Purdy: Pu	0–½	4–20+	0–13	--------	95–100	90–100	90–100	90–100	ML	A–4
			13–50	--------	95–100	90–100	85–100	70–95	ML, CL	A–4, A–7
			50–55	--------	95–100	90–100	85–100	70–90	ML, CL	A–4, A–7
Thorndale: ThA, ThB2	0–½	4–15	0–8	--------	100	95–100	95–100	90–100	ML	A–4
			8–41	--------	100	90–100	90–95	80–95	ML, CL	A–4, A–6
			41–48	--------	95–100	90–95	90–95	80–95	ML, CL	A–4, A–6
Tyler: Ty	½–1½	5–8+	0–10	--------	95–100	90–100	90–100	85–100	ML	A–4, A–6
			10–31	--------	95–100	80–100	80–100	75–90	ML, CL	A–4, A–6
			31–54	--------	95–100	80–100	55–100	30–90	ML, CL, SM-SC	A–4, A–6, A–2
Upshur: UhB2, UhC2, UhD2, UpB, UpD, UpF.	3+	3½–5	0–7	--------	95–100	90–100	80–100	80–100	ML, CL	A–6
			7–22	--------	95–100	95–100	90–100	80–95	ML, CL	A–6, A–7
			22–42	--------	90–100	60–100	40–100	30–95	SC, CL, ML	A–2, A–4, A–7
			42	--------	--------	--------	--------	--------	--------	--------
Weikert (Mapped only in a complex with Gilpin soils.)	3+	1–1½	0–5	0–10	40–70	35–65	30–60	20–55	GM, ML	A–1, A–2, A–4
			5–19	0–20	40–55	35–45	30–40	15–25	GM, GC	A–1, A–2
			19	--------	--------	--------	--------	--------	--------	--------
Westmoreland: WcA, WcB, WcC2, WcD2.	3+	3½–5	0–7	--------	85–100	75–95	70–95	60–85	ML, CL	A–4, A–6
			7–40	0–15	85–100	85–95	75–95	60–80	ML, CL	A–4
			40–52	5–15	30–45	30–45	20–40	15–30	GM, GC	A–2
Wharton: WrA, WrB2, WrC2, WrD2, WrE2, WsB, WsE.	1½–3	4–6	0–7	--------	95–100	90–100	80–95	75–95	ML, CL	A–4, A–6
			7–25	--------	95–100	90–100	80–95	75–90	ML, CL	A–6, A–7
			25–50	--------	90–100	85–100	70–95	65–85	ML, CL, MH	A–4, A–6, A–7
			50	--------	--------	--------	--------	--------	--------	--------

properties of the soils—Continued

Classification—Continued							Corrosion potential	
Dominant USDA texture	Permea-bility	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential	Steel	Concrete
	Inches per hour	*Inches per inch of soil*	*pH*	*Percent*	*Pounds per cubic foot*			
Silt loam	2.0–6.3	0.18–0.24	5.6–6.5	---	---	Low	Moderate	Moderate.
Silt loam	0.63–2.0	0.18–0.22	5.6–6.5	13–20	105–120	Low	Moderate	Moderate.
Silt loam, sandy loam, gravelly sandy loam.	0.63–2.0	0.14–0.18	6.1–7.2	13–16	113–120	Low	Moderate	Low.
Silt loam	2.0–6.3	0.18–0.22	5.6–7.2	---	---	---	---	
Silty clay loam, loam	0.2–0.63	0.18–0.22	5.6–6.8	15–22	100–110	Moderate	High	Moderate.
Loam	0.2–0.63	0.12–0.18	5.6–6.5	15–19	110–115	Low	High	Moderate.
Silt loam	0.63–2.0	0.18–0.24	5.1–6.0	---	---	Low	Moderate	Moderate.
Silty clay loam, clay loam, and loam (fragipan).	0.2–0.63	0.10–0.18	4.5–5.5	16–18	110–118	Low	High	High.
Sandy loam	0.2–0.63	0.10–0.14	4.5–5.5	14–16	115–118	Low	Moderate	High.
Silt loam	2.0–6.3	0.16–0.20	5.6–6.5	---	---	---	---	
Silty clay loam	0.2–0.63	0.12–0.18	5.1–6.0	17–20	100–110	Low	High	Moderate.
Silt loam	0.63–2.0	0.12–0.18	5.6–6.5	14–18	112–118	Low	High	Moderate.
Stratified clay, silt, sand, gravel.								
Silt loam	0.63–2.0	0.12–0.18	5.1–6.0	---	---	Low	Moderate	Moderate.
Silt loam and loam	0.63–2.0	0.10–0.14	4.5–5.5	12–14	110–115	Low	Moderate	Moderate.
Sandy loam	0.63–2.0	0.06–0.10	4.0–5.5	10–12	115–120	Low	Moderate	Moderate.
Silt loam	0.63–2.0	0.18–0.24	4.5–5.5	---	---	Low	High	High.
Silty clay loam	<0.2	0.14–0.16	4.0–5.5	12–21	100–120	Moderate	High	High.
Clay loam	<0.2	0.12–0.16	4.0–5.5	14–16	110–115	Moderate	High	High.
Silt loam	0.63–2.0	0.16–0.20	5.1–7.2	---	---	Low	High	Moderate.
Silty clay loam (fragipan)	<0.2	0.14–0.18	5.6–6.5	12–14	110–115	Moderate	High	Moderate.
Silt loam	<0.2	0.10–0.14	5.6–7.2	12–15	110–115	Moderate	High	Moderate.
Silt loam	0.63–2.0	0.18–0.24	5.0–6.5	---	---	Low	High	High.
Silty clay loam, silt loam	<0.2	0.10–0.14	4.5–5.5	16–18	105–115	Moderate	High	High.
Silt loam, gravelly loam (fragipan).	<0.2	0.10–0.14	4.5–5.5	14–16	110–115	Moderate	High	High.
Silt loam	0.20–0.63	0.12–0.18	5.6–7.2	---	---	Moderate	Low	Moderate.
Silty clay	<0.2	0.10–0.14	5.6–7.2	17–23	95–114	High	High	Moderate.
Shaly silty clay, very shaly silty clay loam.	<0.2	0.08–0.12	5.6–7.2	12–21	100–120	High	High	Moderate.
Shale.								
Channery silt loam	2.0–6.3	0.08–0.12	5.1–6.0	---	---	Low	Low	High.
Channery loam, very channery loam.	2.0–6.3	0.04–0.08	4.5–5.5	11–13	118–122	Low	Low	High.
Sandstone.								
Channery silt loam	2.0–6.3	0.16–0.20	5.1–6.5	---	---	Low	Low	Low.
Silt loam, loam	0.63–2.0	0.10–0.18	5.1–6.5	12–18	110–120	Moderate	Low	Low.
Very channery loam	0.63–2.0	0.06–0.10	5.6–6.0	12–15	115–120	Low	Low	Low.
Silt loam	0.63–2.0	0.16–0.20	5.1–7.2	---	---	Low	Moderate	Moderate.
Silty clay, silty clay loam	0.2–0.63	0.12–0.16	4.5–6.0	16–20	105–110	Moderate	High	High.
Silty clay, silty clay loam, shaly silty clay loam.	<0.2	0.08–0.12	4.5–5.5	14–21	105–118	Moderate	High	High.
Shale.								

TABLE 6.—*Soil interpretations*

[Interpretations were not made for Mine dumps (Md), Rubble land (Ru), Strip mine spoil

Series and map symbols	Suitability for winter grading	Susceptibility to frost action	Soil features affecting Suitability as source of—		Soil features affecting engineering uses for—
			Topsoil	Roadfill	Highway location
Albrights: AbB2, AcB	Poor	Moderate	Generally fair, but poor in stony areas.	Fair	Seasonal high water table; seepage on top of fragipan; sandstone bedrock at depth of 4 to 7 feet.
Allegheny: AlB2, AlC2	Good	Low	Good	Good	Features generally favorable.
Andover: AnB	Poor	High	Generally fair, but poor in stony areas.	Fair to good	High water table; seepage; subject to frost heaving.
Armagh (Mapped only in undifferentiated units with Brinkerton soils.)	Poor	High	Fair	Poor	High water table; susceptible to frost action.
Atkins: At	Poor	High	Fair	Poor	High water table; susceptible to frost action; subject to flooding.
Brinkerton: BaA, BaB (For interpretations of Armagh soils in units BaA and BaB, see the Armagh series.)	Poor	High	Fair to depth of 10 inches.	Poor	High water table; seepage; subject to frost heaving; poor stability.
Brooke: BrB2, BrC2, BrD2	Fair	Moderate	Fair to depth of 10 inches.	Poor	Bedrock at depth of 2 to 3½ feet; poor stability; unstable slope.
Buchanan: BuB, BuD	Poor	Moderate	Poor	Fair	Seasonal high water table; seepage; stoniness.
Cavode: CaB2, CaC2, CaD2, CdB, CdD.	Poor	High	Poor	Poor	Seasonal high water table; susceptible to frost action.
Chavies: Ce	Good	Low	Good	Fair to good	Features generally favorable.
Clarksburg: CgB, CgC2, CgD2 (For interpretations of the Guernsey soils in these mapping units, see the Guernsey series.)	Poor	Moderate	Fair	Fair	Seasonal high water table; seepage on top of fragipan.
Clymer: ClB2, ClC2, CmB, CmD	Good	Low	Fair	Good	Bedrock at depth of 3½ to 7 feet.
Cookport: CoA, CoB2, CoC2, CpB, CpD.	Poor	Moderate	Generally fair, but poor in stony areas.	Fair	Seasonal high water table; seepage on top of fragipan; sandstone bedrock at depth of 3½ to 5 feet.

for selected engineering uses

(SmB, SmD, SmF, SnB, SnD, SnF), and Urban land (UrB, UrD) because of their variability]

Soil features affecting engineering use for—Continued					
Pipeline construction and maintenance	Impoundments		Agricultural drainage	Irrigation	Terraces, diversions, or waterways
	Reservoir area	Embankment			
Seasonal high water table; some stony areas; bedrock at depth of 4 to 7 feet.	Pervious layer in substratum in some places.	Fair stability; fair resistance to piping.	Moderately slow permeability; seasonal high water table.	Moderately slow permeability; seasonal high water table.	Seepage on top of fragipan; seasonal high water table.
Substratum not stable.	Moderately rapidly permeable substratum.	Moderately rapidly permeable substratum.	Well drained.	Features generally favorable.	Features generally favorable.
High water table; stoniness.	Surface stoniness; may have permeable lenses in substratum.	Surface stoniness.	Slow permeability; high water table.	Slow permeability; high water table.	High water table; surface stoniness.
High water table; fair stability; bedrock at depth of 3½ to 6 feet.	Bedrock at depth of 3½ to 6 feet.	Fair stability; clayey material.	Slow permeability; high water table; outlets difficult to locate.	Slow permeability; high water table.	High water table.
High water table; subject to flooding.	Subject to flooding; permeable layers in underlying material.	Poor stability; erodible.	Subject to flooding; high water table; outlets difficult to locate.	High water table; subject to flooding.	High water table; subject to flooding.
High water table.	Features generally favorable.	Poor stability.	Slow permeability; high water table; outlets difficult to locate.	Slow permeability; high water table.	High water table.
Bedrock at depth of 2 to 3½ feet; landslips.	Bedrock at depth of 2 to 3½ feet.	Poor stability; subject to cracking.	Well drained.	Slow permeability.	Bedrock at depth of 2 to 3½ feet; erodible.
Seasonal high water table; stoniness.	Surface stoniness; may have rapidly permeable layers in substratum.	Fair stability; surface stoniness.	Slow permeability; seasonal high water table; stoniness.	Slow permeability; seasonal high water table; stoniness.	Seepage on top of fragipan; surface stoniness; seasonal high water table.
Seasonal high water table; stoniness; bedrock at depth of 3½ to 6 feet.	Stoniness; bedrock at depth of 3½ to 6 feet.	Unstable; surface stoniness; erodible.	Slow permeability; seasonal high water table; surface stoniness.	Slow permeability; seasonal high water table.	Surface stoniness; seasonal high water table; erodible.
Fair stability.	Moderately rapidly permeable substratum.	Fair stability; erodible; subject to piping.	Well drained.	Features generally favorable.	Features generally favorable.
Seasonal high water table.	Seasonal high water table.	Fair stability.	Slow permeability; seasonal high water table.	Seasonal high water table; slow permeability.	Seepage on top of fragipan; erodible on steep slopes; seasonal high water table.
Bedrock at depth of 3½ to 7 feet.	Bedrock at depth of 3½ to 7 feet; moderately rapid permeability.	Stable, pervious material.	Well drained.	Features generally favorable.	Surface stoniness in some areas.
Seasonal high water table; bedrock at depth of 3½ to 5 feet.	Possible permeable layers in substratum; surface stoniness in some areas.	Fair stability; surface stoniness in some areas.	Slow permeability; seasonal high water table.	Slow permeability; seasonal high water table.	Seepage on top of fragipan; surface stoniness in some areas; seasonal high water table.

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TABLE 6.—*Soil interpretations*

Series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as source of— Topsoil	Suitability as source of— Roadfill	Soil features affecting engineering uses for— Highway location
Dekalb: DaF, DbB, DbD, DbF	Good	Low	Poor	Good	Bedrock at depth of 2 to 3½ feet; surface stoniness in some areas.
Elkins: Ek	Unsuitable	High	Fair	Poor	Subject to flooding; high water table; susceptible to frost action.
Ernest: ErA, ErB2, ErC2, EsB, EsD	Poor	Moderate	Generally fair, but poor in very stony areas.	Fair	Seasonal high water table; seepage on top of fragipan.
Gilpin: GcA, GcB2, GcC2, GcD2, GnB, GnD, GnF, GrF. (For interpretations of the Weikert soil in mapping unit GrF, see the Weikert series.)	Good	Low	Generally fair, but poor in stony areas.	Fair	Bedrock at depth of 2 to 3½ feet.
Guernsey: GsB2, GsC2, GsD2, GsE2, GtC3, GtD3.	Poor	High	Fair	Poor	Bedrock at depth of 3½ to 7 feet; seasonal high water table; poor stability; landslips.
Hazleton: HaA, HaB2, HaC2, HaD2	Good	Low	Good	Good	Bedrock at depth of 3½ to 5 feet.
Library: LbB2	Poor	High	Poor	Poor	Seasonal high water table; poor stability; susceptible to frost action.
Lindside: Ln	Poor	Moderate	Good	Fair	Subject to flooding; seasonal high water table.
Melvin: Mc (For interpretations of the Newark soil in this mapping unit, see the Newark series.)	Poor	High	Good	Poor	High water table; subject to flooding.
Monongahela: MoA, MoB2, MoC2	Poor	Moderate	Good	Fair	Seasonal high water table; seepage on top of fragipan.
Newark (Mapped only in an undifferentiated unit with a Melvin soil.)	Poor	High	Good	Poor	Seasonal high water table; subject to flooding.

for selected engineering uses—Continued

Soil features affecting engineering use for—Continued					
Pipeline construction and maintenance	Impoundments		Agricultural drainage	Irrigation	Terraces, diversions, or waterways
	Reservoir area	Embankment			
Bedrock at depth of 2 to 3½ feet; stoniness; permeable substratum.	Bedrock at depth of 2 to 3½ feet; permeable substratum.	Previous material; surface stoniness.	Well drained	Low available moisture capacity.	Bedrock at depth of 2 to 3½ feet; surface stoniness.
High water table; subject to flooding.	Subject to seepage	Subject to slight piping and sliding.	Subject to flooding; high water table; outlets diffcult to locate; slow permeability.	Slow permeability; high water table; subject to flooding.	High water table.
Seasonal high water table.	Stoniness in some areas.	Unstable; surface stoniness in some areas.	Moderately slow permeability; seasonal high water table.	Moderately slow permeability; seasonal high water table; stoniness in some areas.	Seepage on top of fragipan; stoniness in some areas; erodible; seasonal high water table.
Bedrock at depth of 2 to 3½ feet; stoniness in some areas.	Pervious bedrock at depth of 2 to 3½ feet.	Fair stability; subject to piping; stoniness in some areas.	Well drained	Bedrock at depth of 2 to 3½ feet; stoniness in some areas.	Bedrock at depth of 2 to 3½ feet; stoniness in some areas.
Seasonal high water table; bedrock at depth of 3½ to 7 feet; poor stability.	Bedrock at depth of 3½ to 7 feet.	Unstable; erodible	Slow permeability; seasonal high water table.	Slow permeability; seasonal high water table.	Erodible; slips when saturated; seasonal high water table.
Bedrock at depth of 3½ to 5 feet.	Bedrock at depth of 3½ to 5 feet; permeable substratum.	Pervious material; stable.	Well drained	Features generally favorable.	Bedrock at depth of 3½ to 5 feet.
Bedrock at depth of 3½ to 6 feet; seasonal high water table.	Bedrock at depth of 3½ to 6 feet.	Unstable; erodible	Slow permeability; seasonal high water table.	Slow permeability; seasonal high water table.	Erodible; seasonal high water table; poor stability.
Subject to flooding; seasonal high water table.	Possible permeable layers in substratum; subject to flooding.	Subject to flooding; fair stability.	Seasonal high water table; moderate permeability; subject to flooding.	Seasonal high water table; subject to flooding.	Seasonal high water table; subject to flooding.
High water table; fair stability; subject to flooding.	Possible permeable layers in substratum; subject to flooding.	Unstable; erodible	Subject to flooding; moderately slow permeability; high water table; outlets difficult to locate.	High water table; moderately slow permeability; subject to flooding.	High water table; subject to flooding.
Seasonal high water table; seepage over fragipan.	May have pervious layers in substratum.	Fair stability	Moderately slow permeability; seasonal high water table.	Seasonal high water table; moderately slow permeability.	Seepage on top of fragipan; erodible on steeper slopes; seasonal high water table.
Seasonal high water table; fair stability; subject to flooding.	Possible permeable layers in substratum; subject to flooding.	Unstable; subject to piping; erodible; subject to flooding.	Subject to flooding; seasonal high water table; moderately slow permeability.	Seasonal high water table; subject to flooding.	High water table; subject to flooding.

TABLE 6.—*Soil interpretations*

Series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as source of— Topsoil	Suitability as source of— Roadfill	Soil features affecting engineering uses for— Highway location
Philo: Ph	Poor	High	Fair to good	Fair	Seasonal high water table; subject to flooding.
Purdy: Pu	Poor	High	Poor	Poor	High water table
Thorndale: ThA, ThB2	Poor	High	Fair	Poor	High water table; susceptible to frost action; seepage.
Tyler: Ty	Poor	High	Fair	Poor	Seasonal high water table; fair stability.
Upshur: UhB2, UhC2, UhD2, UpB, UpD, UpF.	Fair	Moderate	Fair	Poor	Subject to slides; bedrock at depth of 3½ to 5 feet.
Weikert (Mapped only in a complex with Gilpin soils.)	Good	Low	Poor	Good	Bedrock at depth of 1 to 1½ feet.
Westmoreland: WcA, WcB, WcC2, WcD2.	Good	Low	Good	Fair	Bedrock at depth of 3½ to 5 feet.
Wharton: WrA, WrB2, WrC2, WrD2, WrE2, WsB, WsE.	Poor	High	Generally fair, but poor in stony areas.	Poor	Bedrock at depth of 4 to 6 feet; seasonal high water table; fair stability.

for selected engineering uses—Continued

Soil features affecting engineering use for—Continued					
Pipeline construction and maintenance	Impoundments		Agricultural drainage	Irrigation	Terraces, diversions, or waterways
	Reservoir area	Embankment			
Seasonal high water table; fair stability; subject to flooding.	Possible permeable layers in substratum; subject to flooding.	Subject to flooding	Subject to flooding; seasonal high water table; outlets difficult to locate.	Subject to flooding; seasonal high water table.	Seasonal high water table.
High water table; poor stability.	Features generally favorable.	Poor stability; erodible.	Slow permeability; outlets difficult to locate; high water table.	Slow permeability; high water table.	Slow permeability; high water table.
High water table	Pervious bedrock at depth of 4 to 15 feet.	Unstable; erodible	High water table; slow permeability.	High water table; slow permeability.	High water table.
Seasonal high water table.	May be pervious sand layers in substratum.	Fair stability; erodible.	Slow permeability; seasonal high water table.	Slow permeability; seasonal high water table.	Seasonal high water table.
Landslips; bedrock at depth of 3½ to 5 feet.	Bedrock at depth of 3½ to 5 feet.	Subject to piping; erodible.	Well drained	Slow permeability	Erodible.
Bedrock at depth of 1 to 1½ feet.	Bedrock at depth of 1 to 1½ feet; moderately rapid permeability.	Fair stability; limited quantity; shaly material.	Well drained	Steep slopes; moderately rapid permeability.	Bedrock at depth of 1 to 1½ feet; steep slopes.
Bedrock at depth of 3½ to 5 feet.	Pervious bedrock at depth of 3½ to 5 feet.	Fair stability; erodible.	Well drained	Moderate permeability.	Bedrock at depth of 3½ to 5 feet.
Bedrock at depth of 4 to 6 feet; seasonal high water table; stoniness in some areas.	Pervious bedrock at depth of 4 to 6 feet.	Unstable; stoniness in some areas; erodible.	Slow permeability; seasonal high water table.	Slow permeability; seasonal high water table.	Erodible; stoniness in some areas; slips when saturated; seasonal high water table.

Estimated engineering properties

Table 5 provides estimates of soil properties important to engineering. The estimates are based on field classification and descriptions, on physical and chemical tests of selected representative samples, on test data from comparable soils in adjacent areas, and on detailed experience in working with the soils in the survey area.

Depth to seasonal high water table indicates the depth to which free water rises at least once a year, measured in feet from the surface.

Depth to bedrock is measured in feet from the surface and is the range in which bedrock is encountered in most areas of a particular soil. Bedrock is considered the solid or fractured rock that generally underlies the soil and other unconsolidated material.

Depth from the surface gives the depth to the significant layers for which properties have been estimated. Those layers are described in the section, "Descriptions of the Soils." The estimates of properties of significant layers that are given in succeeding columns are ranges of values for a typical soil profile. Variations from these values are to be expected. Many engineering interpretations need to be based on the soil material below a depth of 6 to 10 inches. The soil above this depth ordinarily contains too much organic matter to be used in engineering structures, but it is commonly saved and used as topsoil on shoulders and slopes to promote the growth of vegetation.

The coarse fraction greater than 3 inches was not measured in the mechanical analysis; it is a field observation made at the time the sample was collected.

USDA texture is determined by the relative proportions of sand, silt, and clay in soil material that is less than 2.0 millimeters in diameter. "Sand," "silt," "clay," and some other terms used in the USDA textural classification are defined in the Glossary of this soil survey.

Permeability, as used in table 5, relates only to movement of water downward through undisturbed and uncompacted soil. It does not include lateral seepage. The estimates are based on structure and porosity of the soil. Plowpans, surface crusts, and other properties resulting from use of the soils are not considered.

Available moisture capacity is the capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Reaction is the degree of acidity or alkalinity of a soil, expressed as a pH value. The pH value and relative terms used to describe soil reaction are defined in the Glossary.

Shrink-swell potential indicates the volume change to be expected when the moisture content of soil material changes. The shrinking and swelling of soils greatly damage building foundations, roads, and other structures. A high shrink-swell potential indicates hazards to the maintenance of structures constructed in, on, or with soil materials.

Corrosion potential indicates the potential danger to uncoated metal or concrete structures through chemical action that dissolves or weakens the structural materials. Structural materials may corrode when buried in soil, and a given material corrodes in some kinds of soil more rapidly than in others. Extensive installations that intersect soil boundaries or soil horizons are more likely to be damaged by corrosion than are installations entirely in one kind of soil or soil horizon.

Soil interpretations for selected engineering uses

Table 6 contains selected information useful to engineers and others who plan to use soil material in construction of highways, farm facilities, buildings, and sewage disposal systems. Detrimental or undesirable features are emphasized, but important desirable features also may be listed. The ratings and other interpretations in this table are based on estimated engineering properties of the soils in table 5; on available test data, including those in table 4; and on field experience. The information strictly applies only to the soil depths indicated in table 5, but it is reasonably reliable to a depth of about 6 feet for most soils and of several more feet for some soils.

Winter grading is affected chiefly by soil features, especially unfavorable ones, that are relevant to moving, mixing, and compacting soil in road building when temperatures are below freezing.

Susceptibility to frost action is affected chiefly by the height and duration of the water table and by the content of fines (silt and clay) in the soil.

Topsoil is a term used to designate a fertile soil or soil material, ordinarily rich in organic matter, used as a topdressing for lawns, gardens, roadbanks, and the like. The ratings indicate suitability for such use.

Roadfill is material used to build embankments. The ratings indicate performance of soil material moved from borrow areas for use in embankments.

Highway location is influenced by features of the undisturbed soil that affect construction and maintenance of highways. The soil features, favorable as well as unfavorable, are the principal ones that affect geographic location of highways.

Pipeline construction and maintenance is influenced by features of the undisturbed soil, such as slope, depth to bedrock, height and duration of the water table, stoniness or rockiness, flooding, and corrosion potential.

Reservoir areas are affected mainly by seepage loss of water, and the soil features are those that influence such seepage.

Embankments serve as dams. The soil features of both subsoil and substratum are those important to the use of soils for constructing embankments.

Agricultural drainage includes both surface and subsurface drainage of undisturbed soil. The main features considered were permeability, height of water table, and seepage.

Irrigation is influenced by features such as soil depth, available moisture capacity, permeability, and stoniness. Only sprinkler type systems were considered.

Terraces, diversions, or waterways are influenced by depth to bedrock, stoniness, seepage, and ease of growing plant cover.

Town and Country Planning [5]

Planning is vital to changing and expanding communities of today. An increasing population, with greater mobility, more leisure time, and a higher standard of living, points to the need for planning the development of grow-

[5] CARL GUERNSEY, soil scientist, Soil Conservation Service, assisted in preparing this subsection.

ing communities. Soil information provides a basic tool for sound planning.

Table 7 lists the estimated degree and kinds of soil limitations for town and country planning. For each use, the soils are rated in terms of the degree of limitation—slight, moderate, or severe. The degree of limitation indicates the severity of problems that are expected to be encountered for the specified use. The major limiting factor or factors are also listed if the soil has a moderate or severe rating.

The rating is *slight* if the soils have few known limitations that affect the use indicated. It is *moderate* if the soils have one or more properties that limit use. Correcting these limitations increases installation and maintenance costs. The rating is *severe* if the soils have one or more properties that seriously limit use. Using soils that have severe limitations increases the probability of failure and adds to the cost of installation and maintenance.

The decision as to whether or not a soil will be used for a specific purpose, regardless of the limitation, is beyond the scope of the information in this subsection. At a price, almost any limitation can be overcome. The information contained in table 7 is valuable in planning more detailed field surveys for determining the inplace condition of the soil at the site.

The uses rated in table 7 are discussed in the following paragraphs.

Onsite disposal of sewage effluent.—Successful operation of a tile disposal field for a septic tank depends upon the ability of the soil to absorb and filter the effluent that passes through the field. Soil properties considered in rating for this use are depth to bedrock, depth to seasonal high water table, permeability, slope, stoniness or rockiness, and frequency of flooding.

Sewage lagoons.—A sewage lagoon is a shallow impoundment designed to hold sewage during the time required for bacteria to decompose the solids. A soil suitable for a lagoon must be nearly level and relatively impermeable so that seepage from the lagoon does not contaminate water supplies. Soil properties considered in rating for this use are depth to bedrock, depth to seasonal high water table, permeability, slope, stoniness or rockiness, and frequency of flooding.

Sites for homes with basements.—Soil properties affect the location, construction, and maintenance of buildings. The ratings in table 7 are for homesites or buildings that have three stories or less and have basements averaging at least 5 feet below the normal level of the ground. A high seasonal water table may cause water to accumulate in the excavation during construction. Tile lines or other drains may be needed to carry water away from the building so that basements will not be wet after construction. Steep slopes are problems during construction, and large boulders or hard bedrock can increase construction costs. Properties considered in rating soils for this use are depth to bedrock, seasonal high water table, slope, and frequency of flooding.

Lawns and landscaping.—The soils are rated for these uses under the assumption that they will be used for turf or for shrubs and trees, or both, without adding topsoil. Suitable soils are capable of supporting a turf that can withstand moderate traffic and can control runoff without erosion. Soil properties considered in rating for this use are texture of surface layer, depth to bedrock, depth to seasonal high water table, stoniness or rockiness, slope, and frequency of flooding.

Streets and parking lots in subdivisions.—The soils are rated for use of locating streets and parking lots in subdivisions rather than for major highways. It is assumed that the roads will have a hard surface. Slopes generally are more critical for streets in subdivisions than for highways. More cut and fill are needed where soils are steep. A seasonal high water table can delay construction and require drainage and expensive fill. Streets located on soils subject to flooding have their use restricted during floods and are subject to damage. Soil properties considered in rating for this use are depth to bedrock, depth to seasonal high water table, rockiness, slope, and frequency of flooding.

Sanitary land fills (trench method).—This rating is for sanitary land fills that use the trench method of operation. A good sanitary land fill should operate without contaminating water supplies, reducing land values, or causing health hazards. In addition, the land fill should be usable during all seasons of the year. Soil properties considered in rating for this use are depth to bedrock, depth to seasonal high water table, slope, permeability, stoniness, rockiness, and flood hazard. Filling or adding cover material is not considered in this rating.

Cemeteries.—Properties of soils in cemeteries should allow for the excavation of graves during any season of the year. Depth to bedrock, seasonal high water table, slope, stoniness or rockiness, and flood hazard were considered in rating the soil for this use.

Use of Soils for Recreation

Outdoor recreation is an important and necessary part of our way of life. Many new recreational facilities will be located around communities to serve an increasing need. A knowledge of soils is essential in selecting sites for various outdoor recreational developments.

Table 8 lists the estimated degree and kind of limitations that influence the use of soils for recreation. Each soil is rated for these uses in terms of the degree of limitation—slight, moderate, or severe. This degree of limitation indicates the severity of the expected problems. Decisions as to whether or not a soil will be used for these specific purposes, regardless of its limitation, is beyond the scope of this publication.

The rating is *slight* if the soils have few limitations to the use specified. It is *moderate* if the soils have one or more properties that limit use. Correcting these limitations increases installation and maintenance costs. The rating is *severe* if the soils have one or more properties that seriously limit use. Using soils that have severe limitations increases the probability of failure and adds to the cost of installation and maintenance.

Soil properties considered in rating soils for recreational development include depth to bedrock, depth to seasonal high water table, slope, texture of the surface layer, stoniness, and frequency of flooding. Each property affects the way a soil responds to a specific recreational use. The information in table 8 should be used for determining the sites that require more detailed onsite investigations. The recreational uses rated in table 8 are discussed in the following paragraphs.

TABLE 7.—*Estimated degree and kinds of soil*

[Limitations were not estimated for Mine dumps (Md), Strip mine spoil (SmB, SnB), and Urban

Series and map symbols	Disposal of effluent from septic tanks	Sewage lagoons	Sites for homes with basements (3 stories or less)
Albrights:			
AbB2	Severe: seasonal high water table; moderately slow permeability.	Moderate: slope	Severe: seasonal high water table.
AcB	Severe: seasonal high water table; moderately slow permeability.	Moderate: slope	Severe: seasonal high water table.
Allegheny:			
AlB2	Slight	Severe: permeable substratum	Slight
AlC2	Moderate: slope	Severe: slope; permeable substratum.	Moderate: slope
Andover: AnB	Severe: high water table; slow permeability.	Moderate: slope	Severe: high water table
Armagh. (Mapped only with Brinkerton soils.)			
Atkins: At	Severe: flooding; high water table.	Severe: flooding	Severe: flooding; high water table.
Brinkerton and Armagh:			
BaA	Severe: high water table; slow permeability.	Slight	Severe: high water table
BaB	Severe: high water table; slow permeability.	Moderate: slope	Severe: high water table
Brooke:			
BrB2	Severe: 2 to 3½ feet to bedrock; slow permeability.	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock.
BrC2	Severe: 2 to 3½ feet to bedrock; slow permeability.	Severe: 2 to 3½ feet to bedrock; slope.	Severe: 2 to 3½ feet to bedrock.
BrD2	Severe: slope; slow permeability; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.
Buchanan:			
BuB	Severe: slow permeability	Moderate: slope	Moderate: seasonal high water table; stony.
BuD	Severe: slope; slow permeability.	Severe: slope	Severe: slope
Cavode:			
CaB2	Severe: seasonal high water table; slow permeability.	Moderate: slope; 3½ to 6 feet to bedrock.	Severe: seasonal high water table.
CaC2	Severe: seasonal high water table; slow permeability.	Severe: slope	Severe: seasonal high water table.
CaD2	Severe: seasonal high water table; slow permeability; slope.	Severe: slope	Severe: seasonal high water table; slope.
CdB	Severe: seasonal high water table; slow permeability.	Moderate: slope 3½ to 6 feet to bedrock.	Severe: seasonal high water table.
CdD	Severe: slope; seasonal high water table; slow permeability.	Severe: slope	Severe: slope; seasonal high water table.

limitations for town and country planning

land (JrB). On these land types, limitations are variable and require onsite investigation]

Lawns and landscaping	Streets and parking lots (subdivisions)	Sanitary land fills (trench method)	Cemeteries
Moderate: seasonal high water table.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table.	Severe: seasonal high water table.
Moderate: stony; seasonal high water table.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table; stony.	Severe: stony.
Slight	Moderate: slope	Slight	Slight.
Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table; stony.
Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table; stony.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Moderate: 2 to 3½ feet to bedrock; silty clay loam surface layer.	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock.
Moderate: 2 to 3½ feet to bedrock; silty clay loam surface layer.	Severe: 2 to 3½ feet to bedrock; slope.	Severe: 2 to 3½ feet to bedrock.	Severe: 3 to 2½ feet to bedrock.
Severe: slope	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.
Moderate: stony	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table; stony.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: stony; slope.
Moderate: seasonal high water table.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table.	Severe: seasonal high water table.
Moderate: seasonal high water table; slope.	Severe: slope	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: slope	Severe: slope	Severe: seasonal high water table; slope.	Severe: seasonal high water table; slope.
Moderate: seasonal high water table; stony.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table.	Severe: seasonal high water table; stony.
Severe: slope	Severe: slope	Severe: slope; seasonal high water table.	Severe: slope; seasonal high water table; stony.

TABLE 7.—*Estimated degree and kinds of soil*

Series and map symbols	Disposal of effluent from septic tanks	Sewage lagoons	Sites for homes with basements (3 stories or less)
Chavies: Ce	Slight	Severe: moderately rapid permeability in substratum.	Slight
Clarksburg-Guernsey:			
CgB	Severe: slow permeability; seasonal high water table.	Moderate: slope	Moderate: seasonal high water table.
CgC2	Severe: slow permeability; seasonal high table.	Severe: slope	Moderate: seasonal high water table; slope.
CgD2	Severe: slope; slow permeability.	Severe: slope	Severe: slope
Clymer:			
ClB2	Moderate: 3½ to 7 feet to bedrock.	Severe: moderately rapid permeability.	Moderate: 3½ to 7 feet to bedrock.
ClC2	Moderate: slope; 3½ to 7 feet to bedrock.	Severe: moderately rapid permeability; slope.	Moderate: slope; 3½ to 7 feet to bedrock.
CmB	Moderate: 3½ to 7 feet to bedrock.	Severe: moderately rapid permeability.	Moderate: stony; 3½ to 7 feet to bedrock.
CmD	Severe: slope	Severe: slope; moderately rapid permeability.	Severe: slope
Cookport:			
CoA	Severe: slow permeability	Moderate: 3½ to 5 feet to bedrock.	Moderate: seasonal high water table; 3½ to 5 feet to bedrock.
CoB2	Severe: slow permeability	Moderate: slope; 3½ to 5 feet to bedrock.	Moderate: seasonal high water table; 3½ to 5 feet to bedrock.
CoC2	Severe: slow permeability	Severe: slope	Moderate: seasonal high water table; 3½ to 5 feet to bedrock; slope.
CpB	Severe: slow permeability	Moderate: slope; 3½ to 5 feet to bedrock.	Moderate: seasonal high water table; stoniness; 3½ to 5 feet to bedrock.
CpD	Severe: slope; slow permeability.	Severe: slope	Severe: slope
Dekalb:			
DaF	Severe: slope; 2 to 3½ feet to bedrock.	Severe: rapid permeability; slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.
DbB	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock; rapid permeability.	Severe: 2 to 3½ feet to bedrock.
DbD, DbF	Severe: 2 to 3½ feet to bedrock; slope.	Severe: 2 to 3½ feet to bedrock; slope; rapid permeability.	Severe: 2 to 3½ feet to bedrock; slope.
Elkins: Ek	Severe: flooding; high water table.	Severe: flooding	Severe: flooding; high water table.
Ernest:			
ErA	Severe: moderately slow permeability.	Slight	Moderate: seasonal high water table.
ErB2	Severe: moderately slow permeability.	Moderate: slope	Moderate: seasonal high water table.
ErC2	Severe: moderately slow permeability.	Severe: slope	Moderate: seasonal high water table.
EsB	Severe: moderately slow permeability.	Moderate: slope	Moderate: seasonal high water table; stony.
EsD	Severe: slope; moderately slow permeability.	Severe: slope	Severe: slope

limitations for town and country planning—Continued

Lawns and landscaping	Streets and parking lots (subdivisions)	Sanitary land fills (trench method)	Cemeteries
Slight	Slight	Slight	Slight.
Slight	Moderate: seasonal high water table; slope.	Severe: seasonal high water table.	Severe: seasonal high water table.
Moderate: slope	Severe: slope	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: slope	Severe: slope	Severe: slope; seasonal high water table.	Severe: seasonal high water table.
Slight	Moderate: slope; 3½ to 7 feet to bedrock.	Moderate: 3½ to 7 feet to bedrock.	Moderate: 3½ to 7 feet to bedrock.
Moderate: slope	Severe: slope	Moderate: slope; 3½ to 7 feet to bedrock.	Moderate: slope; 3½ to 7 feet to bedrock.
Moderate: stony	Moderate: slope; 3½ to 7 feet to bedrock.	Moderate: stony; 3½ to 7 feet to bedrock.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; stony.
Slight	Moderate: seasonal high water table; 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock; seasonal high water table.	Moderate: 3½ to 5 feet to bedrock; seasonal high water table.
Slight	Moderate: seasonal high water table; 3½ to 5 feet to bedrock; slope.	Moderate: seasonal high water table; 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock; seasonal high water table.
Moderate: slope	Severe: slope	Moderate: seasonal high water table; 3½ to 5 feet to bedrock; slope.	Moderate: seasonal high water table; 3½ to 5 feet to bedrock; slope.
Moderate: stony	Moderate: seasonal high water table; slope; 3½ to 5 feet to bedrock.	Moderate: seasonal high water table; 3½ to 5 feet to bedrock; stony.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; stony.
Severe: slope	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.
Moderate: 2 to 3½ feet to bedrock; stony.	Severe: 2 to 3½ feet to bedrock; slope.	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock; stony.
Severe: slope	Severe: slope; 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock; slope.	Severe: 2 to 3½ feet to bedrock; slope; stony.
Severe: high water table	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Slight	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Slight	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Moderate: slope	Severe: slope	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table; slope.
Moderate: stony	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table; stony.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; stony.

TABLE 7.—*Estimated degree and kinds of soil*

Series and map symbols	Disposal of effluent from septic tanks	Sewage lagoons	Sites for homes with basements (3 stories or less)
Gilpin:			
GcA, GcB2	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock.	Moderate: 2 to 3½ feet to bedrock.
GcC2	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock; slope.	Moderate: 2 to 3½ feet to bedrock; slope.
GcD2	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope
GnB	Severe: 2 to 3½ feet to bedrock.	Severe: 2 to 3½ feet to bedrock.	Moderate: 2 to 3½ feet to bedrock; stony.
GnD, GnF	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope; 2 to 3½ feet to bedrock.	Severe: slope
Gilpin-Weikert: GrF	Severe: 1 to 3½ feet to bedrock; slope.	Severe: slope; 1 to 3½ feet to bedrock.	Severe: slope
Guernsey:			
GsB2	Severe: slow permeability	Moderate: slope; 3½ to 7 feet to bedrock.	Moderate: seasonal high water table.
GsC2	Severe: slow permeability	Severe: slope	Moderate: slope; seasonal high water table.
GsD2, GsE2	Severe: slope; slow permeability.	Severe: slope	Severe: slope
GtC3	Severe: slow permeability	Severe: slope	Moderate: slope; seasonal high water table.
GtD3	Severe: slope; slow permeability.	Severe: slope	Severe: slope
Hazleton:			
HaA, HaB2	Moderate: 3½ to 5 feet to bedrock.	Severe: moderately rapid permeability.	Moderate: 3½ to 5 feet to bedrock.
HaC2	Moderate: 3½ to 5 feet to bedrock; slope.	Severe: slope; moderately rapid permeability.	Moderate: 3½ to 5 feet to bedrock; slope.
HaD2	Severe: slope	Severe: slope; moderately rapid permeability.	Severe: slope
Library: LbB2	Severe: seasonal high water table; slow permeability	Moderate: 3½ to 6 feet to bedrock; slope.	Severe: seasonal high water table.
Lindside: Ln	Severe: flooding; seasonal high water table.	Severe: flooding	Severe: flooding
Melvin and Newark: Mc	Severe: flooding; high water table.	Severe: flooding	Severe: flooding; high water table.
Monongahela:			
MoA	Severe: moderately slow permeability.	Slight	Moderate: seasonal high water table.
MoB2	Severe: moderately slow permeability.	Moderate: slope	Moderate: seasonal high water table.
MoC2	Severe: moderately slow permeability.	Severe: slope	Moderate: seasonal high water table; slope.
Newark. (Mapped only with Melvin soils.)			
Philo: Ph	Severe: flooding; seasonal high water table.	Severe: flooding	Severe: flooding
Purdy: Pu	Severe: high water table; slow permeability.	Slight	Severe: high water table

limitations for town and country planning—Continued

Lawns and landscaping	Streets and parking lots (subdivisions)	Sanitary land fills (trench method)	Cemeteries
Moderate: 2 to 3½ feet to bedrock.	Moderate: 2 to 3½ feet to bedrock.	Moderate: 2 to 3½ feet to bedrock.	Moderate: 2 to 3½ feet to bedrock.
Moderate: 2 to 3½ feet to bedrock; slope.	Severe: slope	Moderate: 2 to 3½ feet to bedrock; slope.	Moderate: 2 to 3½ feet to bedrock; slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: 2 to 3½ feet to bedrock; stony.	Moderate: 2 to 3½ feet to bedrock; slope.	Moderate: 2 to 3½ feet to bedrock; stony.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Moderate: slope	Severe: slope	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope; eroded	Severe: slope	Severe: silty clay loam surface layer.	Severe: slope; eroded.
Severe: slope	Severe: slope	Severe: slope; silty clay loam surface layer.	Severe: slope; eroded.
Slight	Moderate: 3½ to 5 feet to bedrock; slope on HaB2.	Moderate: 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock.
Moderate: slope	Severe: slope	Moderate: 3½ to 5 feet to bedrock; slope.	Moderate: 3½ to 5 feet to bedrock; slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: seasonal high water table.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table; silty clay loam surface layer.	Severe: seasonal high water table.
Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding.
Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Slight	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Slight	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Moderate: slope	Severe: slope	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table.
Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.

TABLE 7.—*Estimated degree and kinds of soil*

Series and map symbols	Disposal of effluent from septic tanks	Sewage lagoons	Sites for homes with basements (3 stories or less)
Rubble land: Ru	Severe: stony	Severe: stony; slope	Severe: stony
Strip mine spoil:			
SmD, SmF	Severe: slope	Severe: slope	Severe: slope
SnD, SnF	Severe: slope	Severe: slope	Severe: slope
Thorndale:			
ThA	Severe: high water table; slow permeability.	Slight	Severe: high water table
ThB2	Severe: high water table; slow permeability.	Moderate: slope	Severe: high water table
Tyler: Ty	Severe: seasonal high water table; slow permeability.	Slight	Severe: seasonal high water table.
Upshur:			
UhB2	Severe: slow permeability	Moderate: 3½ to 5 feet to bedrock; slope.	Moderate: 3½ to 5 feet to bedrock.
UhC2	Severe: slow permeability	Severe: slope	Moderate: slope; 3½ to 5 feet to bedrock.
UhD2	Severe: slope; slow permeability.	Severe: slope	Severe: slope
UpB	Severe: slow permeability	Moderate: 3½ to 5 feet to bedrock; slope.	Moderate: 3½ to 5 feet to bedrock; stony.
UpD, UpF	Severe: slope; slow permeability.	Severe: slope	Severe: slope
Urban land: UrD	Severe: slope	Severe: slope	Severe: slope
Weikert. (Mapped only in a complex with Gilpin soils.)			
Westmoreland:			
WcA	Moderate: 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock; moderate permeability.	Moderate: 3½ to 5 feet to bedrock.
WcB	Moderate: 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock; moderate permeability; slope.	Moderate: 3½ to 5 feet to bedrock.
WcC2	Moderate: 3½ to 5 feet to bedrock; slope.	Severe: slope	Moderate: slope; 3½ to 5 feet to bedrock.
WcD2	Severe: slope	Severe: slope	Severe; slope
Wharton:			
WrA	Severe: slow permeability	Moderate: 4 to 6 feet to bedrock.	Moderate: seasonal high water table.
WrB2	Severe: slow permeability	Moderate: 4 to 6 feet to bedrock; slope.	Moderate: seasonal high water table.
WrC2	Severe: slow permeability	Severe: slope	Moderate; seasonal high water table; slope.
WrD2, WrE2	Severe: slow permeability; slope.	Severe: slope	Severe: slope
WsB	Severe: slow permeability	Moderate: 4 to 6 feet to bedrock; slope.	Moderate: seasonal high water table; stony.
WsE	Severe: slow permeability; slope.	Severe: slope	Severe: slope

limitations for town and country planning—Continued

Lawns and landscaping	Streets and parking lots (subdivisions)	Sanitary land fills (trench method)	Cemeteries
Severe: stony	Severe: stony; slope	Severe: stony	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Slight	Moderate: 3½ to 5 feet to bedrock; slope.	Moderate: 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock.
Moderate: slope	Severe: slope	Moderate: slope; 3½ to 5 feet to bedrock.	Moderate: slope; 3½ to 5 feet to bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: stony	Moderate: 3½ to 5 feet to bedrock; slope.	Moderate: 3½ to 5 feet to bedrock; stony.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Slight	Slight	Slight.
Slight	Moderate: slope; 3½ to 5 feet to bedrock.	Moderate: 3½ to 5 feet to bedrock.	Slight.
Moderate: slope	Severe: slope	Moderate: slope; 3½ to 5 feet to bedrock.	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Slight	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Moderate: slope	Severe: slope	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table; slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: stony	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table; stony.	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; stony.

TABLE 8.—*Estimated degree and kind of limitations*

[Strip mine spoil (SmB, SnB) and Urban land (UrB) are too

Series and map symbols	Campsites: Tents	Campsites: Trailers	Service buildings (without basements) in recreational areas
Albrights:			
AbB2	Moderate: seasonal high water table; moderately slow permeability.	Moderate: seasonal high water table; moderately slow permeability; slope.	Moderate: seasonal high water table.
AcB	Moderate: seasonal high water table; moderately slow permeability; stony.	Moderate: seasonal high water table; moderately slow permeability; slope; stony.	Moderate: seasonal high water table.
Allegheny:			
AlB2	Slight	Moderate: slope	Slight
AlC2	Moderate: slope	Severe: slope	Moderate: slope
Andover: AnB	Severe: high water table; slow permeability.	Severe: high water table; slow permeability.	Severe: high water table
Armagh. (Mapped only with Brinkerton soils.)			
Atkins: At	Severe: high water table	Severe: high water table	Severe: flooding; high water table.
Brinkerton and Armagh:			
BaA, BaB	Severe: high water table	Severe: high water table	Severe: high water table
Brooke:			
BrB2	Moderate: slow permeability; silty clay loam surface layer.	Moderate: slow permeability; silty clay loam surface layer; slope.	Slight
BrC2	Moderate: slow permeability; slope; silty clay loam surface layer.	Severe: slope	Moderate: slope
BrD2	Severe: slope	Severe: slope	Severe: slope
Buchanan:			
BuB	Moderate: slow permeability; stony.	Moderate: slow permeability; slope; stony.	Slight
BuD	Severe: slope	Severe: slope	Moderate: slope
Cavode:			
CaB2	Moderate: seasonal high water table; slow permeability.	Moderate: seasonal high water table; slow permeability; slope.	Moderate: seasonal high water table.
CaC2	Moderate: seasonal high water table; slow permeability; slope.	Severe: slope	Moderate: seasonal high water table; slope.
CaD2	Severe: slope	Severe: slope	Severe: slope
CdB	Moderate: seasonal high water table; slow permeability; stony.	Moderate: seasonal high water table; slow permeability; stony; slope.	Moderate: seasonal high water table.
CdD	Severe: slope	Severe: slope	Severe: slope
Chavies: Ce	Slight	Slight	Slight

that affect the use of soils for recreation

variable to be rated. Onsite investigation is needed]

Paths and trails in camping areas	Picnic and play areas (extensive use)	Athletic fields (intensive use)	Golf fairways
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table; stony.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Slight	Slight	Moderate: slope	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer.	Moderate: 2 to 3½ feet to bedrock; silty clay loam surface layer.	Moderate: silty clay loam surface layer; 2 to 3½ feet to bedrock.
Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer; slope.	Severe: slope	Moderate: slope; silty clay loam surface layer; 2 to 3½ feet to bedrock.
Moderate: slope; silty clay loam surface layer.	Severe: slope	Severe: slope	Severe: slope.
Moderate: stony	Slight	Moderate: seasonal high water table; slow permeability.	Moderate: stony.
Moderate: slope; stony	Severe: slope	Severe: slope	Severe: slope.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table; slope.	Moderate: seasonal high water table; slope.
Moderate: slope; seasonal high water table.	Severe: slope	Severe: seasonal high water table; slope.	Severe: slope.
Moderate: seasonal high water table; stony.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table; stony.
Moderate: slope	Severe: slope	Severe: seasonal high water table; slope.	Severe: slope.
Slight	Slight	Slight	Slight.

TABLE 8.—*Estimated degree and kind of limitations*

Series and map symbols	Campsites: Tents	Campsites: Trailers	Service buildings (without basements) in recreational areas
Clarksburg-Guernsey:			
CgB	Moderate: slow permeability; seasonal high water table.	Moderate: slow permeability; seasonal high water table; slope.	Moderate: seasonal high water table.
CgC2	Moderate: slow permeability; seasonal high water table; slope.	Severe: slope	Moderate: seasonal high water table; slope.
CgD2	Severe: slope	Severe: slope	Moderate: seasonal high water table; slope.
Clymer:			
ClB2	Moderate: channery	Moderate: slope; channery	Slight
ClC2	Moderate: slope	Severe: slope	Moderate: slope
CmB	Moderate: stony; channery	Moderate: slope; stony; channery.	Slight
CmD	Severe: slope	Severe: slope	Severe: slope
Cookport:			
CoA	Moderate: slow permeability	Moderate: slow permeability	Slight
CoB2	Moderate: slow permeability	Moderate: slow permeability; slope.	Slight
CoC2	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope
CpB	Moderate: slow permeability; stony.	Moderate: slow permeability; stony; slope.	Slight
CpD	Severe: slope	Severe: slope	Severe: slope
Dekalb:			
DaF	Severe: slope	Severe: slope	Severe: slope
DbB	Moderate: stony; channery	Moderate: slope; stony; channery.	Slight
DbD	Severe: slope	Severe: slope	Severe: slope
DbF	Severe: slope; stony; channery	Severe: slope; stony; channery	Severe: slope
Elkins: Ek	Severe: high water table	Severe: high water table	Severe: flooding; high water table.
Ernest:			
ErA	Moderate: moderately slow permeability.	Moderate: moderately slow permeability.	Slight
ErB2	Moderate: moderately slow permeability.	Moderate: moderately slow permeability; slope.	Slight
ErC2	Moderate: moderately slow permeability; slope.	Severe: slope	Moderate: slope
EsB	Moderate: moderately slow permeability; stony.	Moderate: moderately slow permeability; slope; stony.	Slight
EsD	Severe: slope	Severe: slope	Severe: slope

that affect the use of soils for recreation—Continued

Paths and trails in camping areas	Picnic and play areas (extensive use)	Athletic fields (intensive use)	Golf fairways
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table; slope.	Severe: seasonal high water table; slope.	Moderate: slope; seasonal high water table.
Moderate: slope; seasonal high water table.	Severe: slope	Severe: slope; seasonal high water table.	Severe: slope.
Moderate: channery	Moderate: channery	Severe: channery	Moderate: channery.
Moderate: channery	Moderate: slope; channery	Severe: slope; channery	Moderate: slope; channery.
Moderate: stony; channery	Moderate: channery	Severe: channery	Moderate: stony; channery.
Moderate: slope; stony; channery.	Severe: slope	Severe: slope; channery	Severe: slope.
Slight	Slight	Moderate: slow permeability; seasonal high water table.	Slight.
Slight	Slight	Moderate: slow permeability; slope; seasonal high water table.	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Moderate: stony	Slight	Moderate: slow permeability; seasonal high water table; slope; stony.	Moderate: stony.
Moderate: slope; stony	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope; channery	Severe: slope.
Moderate: stony; channery	Moderate: channery	Severe: channery	Moderate: stony; channery; 2 to 3½ feet to bedrock.
Moderate: slope	Severe: slope	Severe: slope; channery	Severe: slope.
Severe: slope	Severe: slope	Severe: slope; channery	Severe: slope.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Slight	Slight	Moderate: seasonal high water table; moderately slow permeability.	Slight.
Slight	Slight	Moderate: seasonal high water table; moderately slow permeability; slope.	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Moderate: stony	Slight	Moderate: seasonal high water table; moderately slow permeability; slope; stony.	Moderate: stony.
Moderate: slope; stony	Severe: slope	Severe: slope	Severe: slope.

TABLE 8.—*Estimated degree and kind of limitations*

Series and map symbols	Campsites		Service buildings (without basements) in recreational areas
	Tents	Trailers	
Gilpin:			
GcA	Moderate: channery	Moderate: channery	Slight
GcB2	Moderate: channery	Moderate: channery; slope	Slight
GcC2	Moderate: slope; channery	Severe: slope	Moderate: slope
GcD2	Severe: slope	Severe: slope	Severe: slope
GnB	Moderate: channery; stony	Moderate: channery; slope; stony.	Slight
GnD	Severe: slope	Severe: slope	Severe: slope
GnF	Severe: slope	Severe: slope	Severe: slope
Gilpin-Weikert: GrF	Severe: slope	Severe: slope	Severe: slope
Guernsey:			
GsB2	Moderate: slow permeability	Moderate: slow permeability; slope.	Slight
GsC2	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope
GsD2	Severe: slope	Severe: slope	Severe: slope
GsE2	Severe: slope	Severe: slope	Severe: slope
GtC3	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope
GtD3	Severe: slope	Severe: slope	Severe: slope
Hazleton:			
HaA	Moderate: channery	Moderate: channery	Slight
HaB2	Moderate: channery	Moderate: slope; channery	Slight
HaC2	Moderate: channery; slope	Severe: slope	Moderate: slope
HaD2	Severe: slope	Severe: slope	Severe: slope
Library: LbB2	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table; slow permeability; slope.	Moderate: seasonal high water table.
Lindside: Ln	Moderate: flooding	Moderate: flooding	Severe: flooding
Melvin and Newark: Mc	Severe: high water table	Severe: high water table	Severe: flooding; high water table.
Mine dumps: Md	Severe: acid material	Severe: acid material	Variable

that affect the use of soils for recreation—Continued

Paths and trails in camping areas	Picnic and play areas (extensive use)	Athletic fields (intensive use)	Golf fairways
Moderate: channery	Moderate: channery	Severe: channery	Moderate: 2 to 3½ feet to bedrock; channery.
Moderate: channery	Moderate: channery	Severe: channery	Moderate: 2 to 3½ feet to bedrock; channery.
Moderate: channery	Moderate: slope; channery	Severe: slope; channery	Moderate: slope; 2 to 3½ feet to bedrock; channery.
Moderate: channery; slope	Severe: slope	Severe: slope; channery	Severe: slope.
Moderate: channery; stony	Moderate: channery	Severe: channery; stony	Moderate: stony; channery; 2 to 3½ feet to bedrock.
Moderate: slope; stony; channery.	Severe: slope	Severe: slope; channery; stony.	Severe: slope.
Severe: slope	Severe: slope	Severe: slope; channery; stony.	Severe: slope.
Severe: slope	Severe: slope	Severe: slope; channery	Severe: slope; Weikert soils 1 to 1½ feet to bedrock.
Slight	Slight	Moderate: seasonal high water table; slow permeability; slope.	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Moderate: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer.	Severe: slope	Moderate: slope; silty clay loam surface layer.
Moderate: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: channery	Moderate: channery	Severe: channery	Moderate: channery.
Moderate: channery	Moderate: channery	Severe: channery	Moderate: channery.
Moderate: channery	Moderate: slope; channery	Severe: slope; channery	Moderate: slope; channery.
Moderate: slope; channery	Severe: slope	Severe: slope; channery	Severe: slope.
Moderate: seasonal high water table; silty clay loam surface layer.	Moderate: seasonal high water table; silty clay loam surface layer.	Severe: seasonal high water table.	Moderate: seasonal high water table; silty clay loam surface layer.
Slight	Moderate: flooding	Moderate: flooding	Moderate: flooding.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Variable	Severe: acid material	Severe: acid material	Severe: acid material.

TABLE 8.—*Estimated degree and kind of limitations*

Series and map symbols	Campsites		Service buildings (without basements) in recreational areas
	Tents	Trailers	
Monongahela:			
MoA	Moderate: moderately slow permeability.	Moderate: moderately slow permeability.	Slight.
MoB2	Moderate: moderately slow permeability.	Moderate: moderately slow permeability; slope.	Slight.
MoC2	Moderate: moderately slow permeability; slope.	Severe: slope	Moderate: slope
Newark. (Mapped only with Melvin soils).			
Philo: Pn	Moderate: flooding	Moderate: flooding	Severe: flooding
Purdy: Pu	Severe: high water table	Severe: high water table	Severe: high water table
Rubble land: Ru	Severe: stony	Severe: stony	Severe: stony
Strip mine spoil:			
SmD	Severe: slope	Severe: slope	Severe: slope
SmF	Severe: slope	Severe: slope	Severe: slope
SnD	Severe: slope	Severe: slope	Severe: slope
SnF	Severe: slope	Severe: slope	Severe: slope
Thorndale:			
ThA	Severe: high water table	Severe: high water table	Severe: high water table
ThB2	Severe: high water table	Severe: high water table; slope.	Severe: high water table
Tyler: Ty	Moderate: seasonal high water table; slow permeability.	Moderate: seasonal high water table; slow permeability.	Moderate: seasonal high water table.
Upshur:			
UhB2	Moderate: slow permeability	Moderate: slow permeability; slope.	Slight
UhC2	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope
UhD2	Severe: slope	Severe: slope	Severe: slope
UpB	Moderate: slow permeability; stony.	Moderate: slow permeability; slope; stony.	Slight
UpD	Severe: slope	Severe: slope	Severe: slope
UpF	Severe: slope	Severe: slope	Severe: slope
Urban land: UrD	Severe: slope	Severe: slope	Severe: slope
Weikert. (Mapped only in a complex with Gilpin soil.)			
Westmoreland:			
WcA	Moderate: channery	Moderate: channery	Slight
WcB	Moderate: channery	Moderate: channery; slope	Slight
WcC2	Moderate: channery; slope	Severe: slope	Moderate: slope
WcD2	Severe: slope	Severe: slope	Severe: slope

that affect the use of soils for recreation—Continued

Paths and trails in camping areas	Picnic and play areas (extensive use)	Athletic fields (intensive use)	Golf fairways
Slight	Slight	Moderate: seasonal high water table; moderately slow permeability.	Slight.
Slight	Slight	Moderate: seasonal high water table; slow permeability; slope.	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Slight	Moderate: flooding	Moderate: flooding; seasonal high water table.	Moderate: flooding.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Severe: stony	Severe: stony	Severe: stony	Severe: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Severe: high water table	Severe: high water table	Severe: high water table	Severe: high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Slight	Slight	Moderate: slow permeability; slope.	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Moderate: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: stony	Slight	Moderate: slow permeability; slope; stony.	Moderate: stony.
Moderate: stony; slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: channery	Moderate: channery	Severe: channery	Slight.
Moderate: channery	Moderate: channery	Severe: channery	Slight.
Moderate: channery	Moderate: slope; channery	Severe: slope; channery	Moderate: slope.
Moderate: channery; slope	Severe: slope	Severe: slope; channery	Severe: slope.

TABLE 8.—*Estimated degree and kind of limitations*

Series and map symbols	Campsites		Service buildings (without basements) in recreational areas
	Tents	Trailers	
Wharton:			
WrA	Moderate: slow permeability	Moderate: slow permeability	Slight
WrB2	Moderate: slow permeability	Moderate: slow permeability; slope.	Slight
WrC2	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope
WrD2	Severe: slope	Severe: slope	Severe: slope
WrE2	Severe: slope	Severe: slope	Severe: slope
WsB	Moderate: slow permeability; stony.	Moderate: slow permeability; slope; stony.	Slight
WsE	Severe: slope	Severe: slope	Severe: slope

Campsites for tents and trailers.—The ratings apply to soils that provide sites suitable for tents that have platforms, for parking small trailers, and for the accompanying activities in outdoor living. These areas are used frequently during the camping season, which normally extends from May 30 until Labor Day. The soils are rated under the assumption that there will be little site preparation other than the shaping and leveling of areas for tents and parking. The site should be suitable for heavy traffic by people, horses, or vehicles. Suitability of the soils for supporting vegetation should be considered in the final evaluation.

Buildings without basements.—The soils are rated according to limitations to use as building sites for seasonal and year-round cottages, washrooms and bathhouses, picnic shelters, and service buildings, all without basements. Soil limitations to use for buildings that have basements are given in table 7, "Estimated degree and kinds of limitations for town and country planning."

Paths and trails.—Paths and trails are areas that are to be used for trails, cross-country hiking, bridle paths, and other nonintensive uses for which there is random movement of people. It is assumed that these areas are to be used as they occur in nature and that little soil is moved (excavated). Swamps, marshes, peat bogs, sand dunes, and the like have very severe limitations.

Picnic and play areas.—These are areas to be developed for hiking, picnicking, and casual play where only light foot traffic is expected. The ratings are based on soil features only and do not include the presence of trees, lakes, or other features that may affect the desirability of a site. Suitability of soil for supporting vegetation should be considered in the final evaluation.

Athletic fields.—The soil ratings apply to areas that are to be developed as playgrounds for organized games, such as baseball, football, and badminton. Because athletic fields have intensive foot traffic, generally required are soils that are nearly level, have good drainage, and have texture and consistence that give a firm surface. The most desirable soils also are free of rock outcrops and coarse fragments. It is assumed that a good plant cover can be established and maintained where needed.

Golf fairways.—The soils are rated for this use under the assumption that they will be used for turf, shrubs, and trees without adding topsoil. Traps, roughs, and greens were not considered in ratings for golf fairways.

Descriptions of the Soils

This section describes the soil series and mapping units in Fayette County. The procedure is first to describe the soil series, and then the mapping units in that series. Thus, to get full information on any mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs.

A profile is described for each soil series, and this profile is considered typical for all the soils in that series. First is a nontechnical description of the profile in paragraph form, followed by a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations. If a soil of a given series differs from the one described in the typical profile, the differences are pointed out in the description of that soil, unless they are apparent in the name of the soil.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Rubble land, for example, does not belong to a soil series, but, nevertheless, is listed in alphabetical order along with the soil series.

In describing the typical profile, the color of each horizon is described in words, such as yellowish brown, but it can also be indicated by symbols for the hue, value, and chroma, such as 10YR 5/4. These symbols, called Munsell color notations (*16*), are used by soil scientists to evaluate

that affect the use of soils for recreation—Continued

Paths and trails in camping areas	Picnic and play areas (extensive use)	Athletic fields (intensive use)	Golf fairways
Slight	Slight	Moderate: seasonal high water table; slow permeability.	Slight.
Slight	Slight	Moderate: seasonal high water table; slow permeability; slope.	Slight.
Slight	Moderate: slope	Severe: slope	Moderate: slope.
Moderate: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: stony	Slight	Moderate: slow permeability; seasonal high water table.	Moderate: stony.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.

the color of the soil precisely. Except where noted otherwise, colors given are for the soil when moist.

Following the name of each mapping unit, there is a symbol in parentheses, This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit in which the mapping unit has been placed. The page on which the capability unit is described can be found by referring to the "Guide to Mapping Units" at the back of this survey.

Many terms used in the soil descriptions and in other parts of the survey are defined in the Glossary. The acreage and proportionate extent of the mapping units are shown in table 9. The locations of the soils in Fayette County are shown on the detailed map at the back of this survey.

Albrights Series

The Albrights series consists of deep, moderately well drained to somewhat poorly drained, loamy soils of the uplands. These soils developed in materials weathered from red shale and sandstone. They have a compact fragipan and contain some gravel and stones. The nearly level and gently sloping Albrights soils are in concave areas along narrow drainageways and at the base of steeper slopes. Common trees are red oak, yellow-poplar, sassafras, maple, walnut, ash, and cherry.

A typical cultivated Albrights soil has a dark reddish-gray silt loam plow layer about 7 inches thick. The upper part of the subsoil, between depths of 7 and 27 inches, is dark reddish-brown, yellowish-red, and reddish-brown silt loam and gravelly clay loam. It is mottled at a depth of about 17 inches. The reddish-brown gravelly loam lower part of the subsoil is compact and very firm and extends to a depth of 50 inches. It is distinctly mottled.

Albrights soils are moderately slowly permeable and have a seasonal high water table that rises to within 1 to 3 feet of the surface. These soils are medium acid to strongly acid and have moderate fertility. Limitations to use for onsite sewage disposal are severe because permeability is restricted and wetness results.

Representative profile of Albrights silt loam, 3 to 8 percent slopes, moderately eroded, in a pasture 2 miles northeast of Nicolay:

Ap—0 to 7 inches, dark reddish-gray (5YR 4/2) silt loam; weak, fine, granular structure; friable, slightly sticky and slightly plastic; 10 percent pebbles up to one-half inch in diameter; medium acid; clear, wavy boundary.

B1—7 to 10 inches, dark reddish-brown (5YR 3/4) silt loam; moderate, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; 10 percent pebbles up to one-half inch in diameter; strongly acid; clear, wavy boundary.

B21t—10 to 17 inches, yellowish-red (5YR 4/6) gravelly clay loam; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky; firm, sticky and plastic; thin continuous clay films on ped faces; 15 percent pebbles up to 1½ inches in diameter; strongly acid; clear, wavy boundary.

B22t—17 to 27 inches, reddish-brown (2.5YR 4/4) gravelly clay loam; common, medium, faint, pale-red (2.5YR 6/2) mottles; weak, very coarse, prismatic structure parting to moderate, medium, subangular blocky; firm, sticky and plastic; thick continuous clay films on ped and prism faces; 15 percent pebbles up to 1½ inches in diameter; medium acid; clear, wavy boundary.

Bx—27 to 50 inches +, reddish-brown (2.5YR 5/4) gravelly loam; many, coarse, distinct, reddish-gray (10R 6/1) and red (10R 4/8) mottles; weak, very coarse, prismatic structure parting to weak, very thick, platy; very firm, slightly sticky and slightly plastic; thin discontinuous clay films on prism faces; many, fine and medium, black concretions; 20 percent pebbles up to 1½ inches in diameter and a few stones up to 16 inches in diameter; many, small pockets of sand; medium acid.

Depth to bedrock ranges from 4 to 7 feet. Depth to the fragipan ranges from about 24 to 32 inches. Coarse fragments make up from 5 to 25 percent of the soil mass. The Ap horizon is dark reddish gray or reddish brown. The B horizons range from dark reddish brown to reddish brown and yellowish red in color and are clay loam, loam, silt loam, or silty clay loam in texture. In places the B horizons are gravelly. Mottling begins in the upper 10 inches of the Bt horizon. The B horizons are medium acid to strongly acid.

TABLE 9.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Albrights silt loam, 3 to 8 percent slopes, moderately eroded	2, 300	0. 5
Albrights very stony silt loam, 0 to 8 percent slopes	440	0. 1
Allegheny fine sandy loam, 3 to 8 percent slopes, moderately eroded	650	0. 1
Allegheny fine sandy loam, 8 to 15 percent slopes, moderately eroded	260	0. 1
Andover very stony loam, 0 to 8 percent slopes	5, 030	1. 0
Atkins silt loam	3, 700	0. 7
Brinkerton and Armagh silt loams, 0 to 3 percent slopes	2, 300	0. 5
Brinkerton and Armagh silt loams, 3 to 8 percent slopes	3, 710	0. 7
Brooke silty clay loam, 3 to 8 percent slopes, moderately eroded	1, 800	0. 4
Brooke silty clay loam, 8 to 15 percent slopes, moderately eroded	1, 830	0. 4
Brooke silty clay loam, 15 to 25 percent slopes, moderately eroded	1, 045	0. 2
Buchanan very stony loam, 0 to 8 percent slopes	1, 355	0. 3
Buchanan very stony loam, 8 to 25 percent slopes	1, 570	0. 3
Cavode silt loam, 3 to 8 percent slopes, moderately eroded	4, 310	0. 9
Cavode silt loam, 8 to 15 percent slopes, moderately eroded	2, 380	0. 5
Cavode silt loam, 15 to 25 percent slopes, moderately eroded	1, 060	0. 2
Cavode very stony silt loam, 0 to 8 percent slopes	310	0. 1
Cavode very stony silt loam, 8 to 25 percent slopes	250	(1)
Chavies fine sandy loam	1, 500	0. 3
Clarksburg-Guernsey silt loams, 2 to 8 percent slopes	10, 000	2. 0
Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded	8, 000	1. 6
Clarksburg-Guernsey silt loam, 15 to 25 percent slopes, moderately eroded	1, 000	0. 2
Clymer channery loam, 3 to 12 percent slopes, moderately eroded	2, 880	0. 6
Clymer channery loam, 12 to 20 percent slopes, moderately eroded	720	0. 2
Clymer very stony loam, 0 to 12 percent slopes	400	0. 1
Clymer very stony loam, 12 to 30 percent slopes	575	0. 1
Cookport loam, 0 to 3 percent slopes	360	0. 1
Cookport loam, 3 to 8 percent slopes, moderately eroded	2, 300	0. 5
Cookport loam, 8 to 15 percent slopes, moderately eroded	1, 140	0. 2
Cookport very stony loam, 0 to 8 percent slopes	1, 230	0. 2
Cookport very stony loam, 8 to 25 percent slopes	2, 840	0. 6
Dekalb channery loam, 30 to 60 percent slopes	5, 370	1. 1
Dekalb very stony sandy loam, 0 to 12 percent slopes	5, 800	1. 1
Dekalb very stony sandy loam, 12 to 30 percent slopes	13, 500	2. 6
Dekalb very stony sandy loam, 30 to 80 percent slopes	37, 400	7. 4
Elkins silt loam	600	0. 1
Ernest silt loam, 0 to 3 percent slopes	300	0. 1
Ernest silt loam, 3 to 8 percent slopes, moderately eroded	9, 680	2. 0
Ernest silt loam, 8 to 15 percent slopes, moderately eroded	7, 690	1. 5
Ernest very stony silt loam, 0 to 8 percent slopes	6, 585	1. 3
Ernest very stony silt loam, 8 to 25 percent slopes	5, 865	1. 2
Gilpin channery silt loam, 0 to 3 percent slopes	1, 156	0. 2
Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded	21, 310	4. 2
Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded	19, 360	3. 8
Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded	15, 525	3. 1
Gilpin very stony silt loam, 0 to 12 percent slopes	3, 285	0. 6
Gilpin very stony silt loam, 12 to 30 percent slopes	7, 145	1. 4
Gilpin very stony silt loam, 30 to 60 percent slopes	20, 650	4. 1
Gilpin-Weikert channery silt loams, 30 to 60 percent slopes	46, 270	9. 1
Guernsey silt loam, 3 to 8 percent slopes, moderately eroded	11, 605	2. 3
Guernsey silt loam, 8 to 15 percent slopes, moderately eroded	22, 625	4. 5
Guernsey silt loam, 15 to 25 percent slopes, moderately eroded	9, 235	1. 8
Guernsey silt loam, 25 to 35 percent slopes, moderately eroded	3, 075	0. 6
Guernsey silty clay loam, 8 to 15 percent slopes, severely eroded	1, 580	0. 3
Guernsey silty clay loam, 15 to 25 percent slopes, severely eroded	1, 435	0. 2
Hazleton channery loam, 0 to 3 percent slopes	655	0. 1
Hazleton channery loam, 3 to 12 percent slopes, moderately eroded	11, 670	2. 2
Hazleton channery loam, 12 to 20 percent slopes, moderately eroded	7, 635	1. 5
Hazleton channery loam, 20 to 30 percent slopes, moderately eroded	5, 975	1. 2
Library silty clay loam, 2 to 8 percent slopes, moderately eroded	1, 060	0. 2
Lindside silt loam	3, 425	0. 7
Melvin and Newark silt loams	2, 200	0. 4
Mine dumps	3, 110	0. 6
Monongahela silt loam, 0 to 3 percent slopes	1, 600	0. 3
Monongahela silt loam, 3 to 8 percent slopes, moderately eroded	4, 900	1. 0
Monongahela silt loam, 8 to 15 percent slopes, moderately eroded	610	0. 1
Philo silt loam	4, 400	0. 9
Purdy silt loam	460	0. 1
Rubble land	250	(1)
Strip mine spoil, acid, undulating	205	(1)
Strip mine spoil, acid, rolling	255	0. 1
Strip mine spoil, acid, steep	1, 585	0. 3
Strip mine spoil, nonacid, undulating	2, 260	0. 4
Strip mine spoil, nonacid, rolling	3, 770	0. 7
Strip mine spoil, nonacid, steep	6, 265	1. 2
Thorndale silt loam, 0 to 3 percent slopes	790	0. 2
Thorndale silt loam, 3 to 8 percent slopes, moderately eroded	1, 680	0. 3
Tyler silt loam	1, 025	0. 2
Upshur silt loam, 3 to 8 percent slopes, moderately eroded	2, 060	0. 4
Upshur silt loam, 8 to 15 percent slopes, moderately eroded	2, 975	0. 6
Upshur silt loam, 15 to 25 percent slopes, moderately eroded	2, 795	0. 6
Upshur very stony silt loam, 0 to 8 percent slopes	640	0. 1
Upshur very stony silt loam, 8 to 25 percent slopes	2, 430	0. 5
Upshur very stony silt loam, 25 to 50 percent slopes	13, 160	2. 2
Urban land, undulating	6, 800	1. 1

See footnote at end of table.

TABLE 9.—*Approximate acreage and proportionate extent of the soils*—Continued

Soil	Acres	Percent	Soil	Acres	Percent
Urban land, rolling	1, 880	0. 4	Wharton silt loam, 8 to 15 percent slopes, moderately eroded	11, 600	2. 3
Westmoreland channery silt loam, 0 to 3 percent slopes	410	0. 1	Wharton silt loam, 15 to 25 percent slopes, moderately eroded	6, 420	1. 3
Westmoreland channery silt loam, 3 to 12 percent slopes	9, 665	1. 9	Wharton silt loam, 25 to 35 percent slopes, moderately eroded	1, 890	0. 4
Westmoreland channery silt loam, 12 to 20 percent slopes, moderately eroded	13, 620	2. 6	Wharton very stony silt loam, 0 to 8 percent slopes	455	0. 1
Westmoreland channery silt loam, 20 to 30 percent slopes, moderately eroded	9, 195	1. 8	Wharton very stony silt loam, 8 to 30 percent slopes	4, 000	0. 8
Wharton silt loam, 0 to 3 percent slopes	205	(1)			
Wharton silt loam, 3 to 8 percent slopes, moderately eroded	7, 875	1. 6	Total	508, 160	100. 0

[1] Less than 0.05 percent. These small percentages account for 0.2 percent of the total acreage.

Albrights soils occur in close association with the deep, well-drained Upshur and Hazleton soils of the uplands. They are more reddish throughout than the Clarksburg soils, which occupy similar positions and have similar drainage in areas of gray and brown shale.

Albrights silt loam, 3 to 8 percent slopes, moderately eroded (AbB2).—The profile of this soil is the one described as typical for the series. Included in mapping are some deep, moderately well drained soils that have a clayey subsoil. They make up about 10 percent of the mapping unit. A few soils that have little or no mottling are also included. A few wet spots from seepage occur in some parts of this unit.

Erosion can be easily controlled, and wetness is not a major concern where most crops are grown. The compact fragipan restricts air and water movement and root penetration. This soil is mostly used for grass and trees. It is suited to most cultivated crops grown in the county. The use of this soil for building sites has been encouraged because the soil is gently sloping and has desirable locations in the landscape. (Capability unit IIe-2)

Albrights very stony silt loam, 0 to 8 percent slopes (AcB).—This soil has a profile similar to that described as typical for the series, but it has stones on the surface and in the surface layer. The stones range from a foot to several feet in diameter. Some very stony soils that have a clayey subsoil are included with this soil in mapping.

This soil is mostly woodland. It is well suited to that use. (Capability unit VIs-2)

Allegheny Series

The Allegheny series consists of deep, well-drained, loamy soils that formed in old sediments deposited by streams. These gently sloping and sloping soils are on high bottoms and terraces along rivers. Some of the terraces are several hundred feet above the streams. The surface of these soils is smooth and convex. Common trees are oak, maple, ash, yellow-poplar, and sassafras.

A typical cultivated Allegheny soil has a dark grayish-brown fine sandy loam plow layer about 8 inches thick. Between depths of 8 and 38 inches is a subsoil of yellowish-brown and dark yellowish-brown to brown, very friable loam. Underlying the subsoil is very friable, yellowish-brown loam. Pockets of this material are faintly mottled.

Allegheny soils have moderate permeability and moderate available moisture capacity. Surface runoff is medium, and the erosion hazard is slight to moderate. The water table is lower than 3 feet from the surface. Bedrock normally is at a depth between 5 and 12 feet. These soils are generally very strongly acid. They are well suited to all general farm crops grown in the county. Allegheny soils are easily tilled and can be intensively cropped. Alfalfa, orchards, and truck crops are suitable for these soils. Limitations to use for most community development and engineering work are slight.

Representative profile of Allegheny fine sandy loam, 3 to 8 percent slopes, moderately eroded, in an idle field north of Albert Gallatin High School:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable, nonsticky and nonplastic; numerous fine roots; 10 percent cobblestones; very strongly acid; abrupt, smooth boundary.

B1—8 to 17 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, medium, granular structure and weak, fine, subangular blocky structure; very friable, nonsticky and nonplastic; clay bridging of sand grains; very strongly acid; abrupt, wavy boundary.

B21t—17 to 25 inches, brown (10YR 5/3) loam; weak, fine and medium, granular structure and weak, medium, subangular blocky structure; very friable, slightly sticky and slightly plastic; thin discontinuous clay films on ped faces and bridging of sand grains; very strongly acid; clear, wavy boundary.

B22t—25 to 33 inches, yellowish-brown (10YR 5/4) heavy loam; weak, very fine to medium, subangular blocky structure; very friable, nonsticky and nonplastic; thin continuous clay films on ped faces and bridging of sand grains; very strongly acid; clear, smooth boundary.

B3—33 to 38 inches, yellowish-brown (10YR 5/4) loam; weak, fine and medium, subangular blocky structure; very friable, nonsticky and nonplastic; clay bridging of some sand grains; very strongly acid; gradual, smooth boundary.

C—38 to 60 inches +, yellowish-brown (10YR 5/4) loam; common, medium, faint, pale-brown (10YR 6/3) patches, pockets, or both; weak, fine, granular structure and weak, very fine to fine, subangular blocky structure; very friable, nonsticky and nonplastic; very strongly acid.

The solum is about 30 to 40 inches thick. Bedrock normally is at a depth of 5 to 12 feet or more. Gravel and cobblestones make up from 0 to 10 percent of the soil mass, and reaction ranges from strongly acid to very strongly acid. The Ap horizon ranges from dark grayish brown (10YR 4/2) to brown

(10YR 4/3). The B horizons range from brown (10YR 4/3) to light brown (7.5YR 6/4). They are sandy clay loam or loam. The C horizon is brown (10YR 5/3) or yellowish brown (10YR 5/4).

Allegheny soils occur in close association with the well drained Chavies soils on stream terraces and the moderately well drained Philo soils on the flood plains. They have more clay in the subsoil than Chavies and Philo soils and are better drained than the Philo. Allegheny soils also occur in association with Monongahela, Tyler, and Purdy soils. In contrast to the Allegheny soils, the moderately well drained Monongahela soils and the somewhat poorly drained Tyler soils have a fragipan, and the Purdy soils are poorly drained.

Allegheny fine sandy loam, 3 to 8 percent slopes, moderately eroded (AlB2).—The profile of this soil is the one described as typical for the series. The areas of this soil are about 3 to 25 acres in size and normally are oval in shape. Some areas, especially those near the larger rivers, are gravelly and cobbly. Included with this soil in mapping are some nearly level Allegheny soils and a few severely eroded areas.

Most areas of this soil are idle or are in community developments. (Capability unit IIe-1)

Allegheny fine sandy loam, 8 to 15 percent slopes, moderately eroded (AlC2).—The profile of this soil differs from that of a typical Allegheny soil by having a thinner, lighter colored surface layer. This soil is mostly on the higher areas of bottoms along rivers. Included in mapping are some moderately steep Allegheny soils and a few severely eroded areas.

Nearly all areas of this soil are idle. Slope is the major limitation to most uses. (Capability unit IIIe-1)

Andover Series

The Andover series consists of deep, poorly drained, loamy soils. These soils formed in materials that accumulated at the base of steeper slopes. Andover soils are nearly level and gently sloping and generally are on the concave foot slopes of Chestnut Ridge and Laurel Hill. Common trees are red oak, red maple, elm, ash, and sycamore.

A typical Andover soil in woodland has a thin, dark-colored organic mat on the surface. This mat is underlain by a surface layer consisting of three thin loamy layers that together are 8 inches thick. From the top downward, these layers are very dark gray, dark gray, and light brownish gray. They have many stones. The upper part of the subsoil, between depths of 8 and 25 inches, is light brownish-gray heavy loam and cobbly sandy clay loam distinctly mottled with gray and brown. The lower part of the subsoil, from about 25 to 42 inches, is light brownish-gray gravelly fine sandy loam that is distinctly mottled, very firm, and compact. It contains some rounded stones about 12 inches in diameter. The gravelly sandy loam underlying material, between depths of 42 and 88 inches, is grayish brown distinctly mottled with gray. It also is very firm and compact and contains many stones up to 18 inches in diameter.

Andover soils are slowly permeable and have slow to medium surface runoff. During wet seasons the water table rises to the surface or within one-half foot of the surface. Andover soils are very stony and are suited to trees. The limitation to use for onsite sewage disposal is severe because of the high water table and the slowly permeable fragipan.

Representative profile of Andover very stony loam, 0 to 8 percent slopes, in gently sloping woodland 1 mile northeast of Fairchance:

O1—2½ inches to 1 inch, recently deposited deciduous leaf litter.

O2—1 inch to 0, black mull.

A11—0 to 3 inches, very dark gray (10YR 3/1) loam; very weak, fine, granular structure; very friable, nonsticky and nonplastic; 5 percent pebbles up to 1 inch in diameter and 20 percent stones 1 to 3 feet in diameter; extremely acid; abrupt, smooth boundary.

A12—3 to 6 inches, dark-gray (10YR 4/1) gravelly loam; weak, fine, granular structure; very friable, nonsticky and nonplastic; 15 percent pebbles up to 1½ inches in diameter and 15 percent stones 1 to 3 feet in diameter; extremely acid; abrupt, smooth boundary.

A2g—6 to 8 inches, light brownish-gray (10YR 6/2) cobbly loam; weak, fine and medium, granular structure; friable, slightly sticky and slightly plastic; 15 percent pebbles up to 1 inch in diameter; 30 percent rounded sandstone fragments up to 10 inches long; extremely acid; abrupt, smooth boundary.

B21tg—8 to 10 inches, grayish-brown (2.5Y 5/2) heavy loam; few, fine, distinct, light-gray to gray (10YR 6/1) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; thin, continuous clay films on ped faces; 10 percent rounded sandstone fragments up to 8 inches long; extremely acid; clear, wavy boundary.

B22tg—10 to 25 inches, light brownish-gray (2.5Y 6/2) cobbly sandy clay loam; common, medium, distinct, gray (10YR 6/1) and strong-brown (7.5YR 5/8) mottles; weak, medium, subangular blocky structure; firm, slightly sticky and slightly plastic; very thin continuous clay films on ped faces; 10 percent gravel and 30 percent sandstone fragments up to 8 inches long; very strongly acid; abrupt, wavy boundary.

Bxg—25 to 42 inches, light brownish-gray (2.5Y 6/2) gravelly fine sandy loam; many, coarse, distinct, gray (N 5/0) and strong-brown (7.5YR 5/8) mottles; weak, coarse, prismatic structure; very firm, slightly sticky and nonplastic; thin continuous clay films on prism faces; 25 percent gravel and 10 percent rounded sandstone fragments up to 12 inches long; very strongly acid; wavy boundary.

Cxg—42 to 88 inches +, grayish-brown (10YR 5/2) gravelly sandy loam; many, coarse, distinct, gray (N 6/0) mottles; weak, coarse, prismatic structure; very firm, nonsticky and nonplastic; 35 percent gravel and 15 percent sandstone fragments up to 18 inches long; very strongly acid.

The solum is 40 to 48 inches thick. Rounded sandstone fragments range from gravel to boulders in size. They make up 5 to 35 percent of the solum and 20 to 40 percent of the C horizon. Reaction throughout the soil is very strongly acid or extremely acid. Depth to bedrock ranges from 6 to 12 feet, and depth to the high water table is from 0 to ½ foot. The A1 horizon ranges from very dark gray to dark grayish brown. The A2 and the upper B horizons range from grayish brown to light brownish gray. The upper B horizons are mottled with light gray, gray, strong brown, and yellowish brown. They are gravelly or cobbly loam, sandy clay loam, clay loam, or sandy loam. The Bxg horizon is light brownish gray or grayish brown. It is gravelly or cobbly fine sandy loam, sandy clay loam, or loam. The C horizon is gravelly, very gravelly, or cobbly sandy loam.

Andover soils occur in close association with the moderately well drained Buchanan soils. Also nearby are the well-drained Clymer, Hazleton, and Dekalb soils.

Andover very stony loam, 0 to 8 percent slopes (AnB).—Areas of this soil are about 10 to 25 acres in size and are elongated. Stones on the surface are from 1 to several feet in diameter.

Included with this soil in mapping are areas of poorly drained and very poorly drained soils that lack a fragipan

Also included are a few areas of soils that are shallower to bedrock than this soil. (Capability unit VIIs-1)

Armagh Series

The Armagh series consists of deep, poorly drained soils that formed in clayey materials weathered primarily from clay shale. These nearly level and gently sloping soils are mostly on the low broad upland areas between Chestnut Ridge and Laurel Hill. Surface topography is smooth to slightly concave. Common trees are maple, sycamore, elm, alder, and beech. Ironweed, thistle, and plantain are other common plants.

A typical cultivated Armagh soil has a gray silt loam surface layer mottled with yellowish brown. It is about 9 inches thick. The subsoil, between depths of 9 and 26 inches, is firm, gray silty clay loam that has prominent, reddish-brown mottles. The underlying material, from a depth of 26 to 60 inches, is a gray to light-gray silty clay mottled with strong brown, reddish brown, and red. This material is firm, sticky, and plastic.

Armagh soils are slowly permeable and have a water table that rises to or within one-half foot of the surface. These soils have a sticky and plastic subsoil that is difficult to manage when wet. After heavy rains, water remains on the surface for several days. Armagh soils are suited to hay, particularly varieties that are tolerant of wet soils. Heaving of alfalfa is severe in winter. These soils have a good potential for pond sites, but the limitation to use for onsite sewage disposal is severe.

Representative profile of Armagh silt loam in an area of Brinkerton and Armagh silt loams, 0 to 3 percent slopes, in a pasture 1 mile south of Markleysburg:

Ap—0 to 6 inches, gray (10YR 5/1) silt loam; few, fine, faint, light-gray (5Y 7/1) and yellowish-brown (10YR 5/8) mottles; weak, fine, granular structure; friable, slightly sticky and slightly plastic; strongly acid; abrupt, wavy boundary.

A2g—6 to 9 inches, gray (N 5/0) heavy silt loam; few, fine, faint, light-gray (N 7/0) mottles; weak, fine and medium, granular structure; friable, slightly sticky and slightly plastic; strongly acid; abrupt, wavy boundary.

B21tg—9 to 19 inches, gray (N 5/0) silty clay loam; common, fine, prominent, reddish-brown (5YR 4/4) mottles; moderate, coarse, prismatic structure parting to weak, coarse, subangualr blocky; firm, slightly sticky and plastic; thick continuous clay films on ped and prism faces; medium acid; abrupt, wavy boundary.

B22tg—19 to 26 inches, gray (N 5/0) silty clay loam; common, fine, prominent, reddish-brown (5YR 4/4) mottles; moderate, coarse, prismatic structure parting to weak, medium, subangular blocky; firm, slightly sticky and plastic; thin continuous clay films on prism and ped faces; medium acid; abrupt, wavy boundary.

Clg—26 to 37 inches, gray (N 5/0) silty clay; common, fine, distinct, reddish-brown (5YR 5/4) mottles; massive; firm, sticky and plastic; strongly acid; clear, wavy boundary.

C2g—37 to 42 inches, light-gray (N 7/0) heavy silty clay; common, prominent, strong-brown (7.5YR 5/8) mottles; massive; firm, sticky and plastic; strongly acid; clear, wavy boundary.

C3g—42 to 60 inches +, gray (N 5/0) silty clay; common, medium, prominent, red (2.5YR 5/8) mottles; firm, sticky and plastic; strongly acid.

Depth to bedrock ranges from 3½ to 6 feet. Depth to the water table is from 0 to ½ foot. The Ap horizon is gray or grayish brown. The B horizons colors are neutral or in the 2.5Y hue, and they range from gray to grayish brown or light brownish gray. Mottles in the B horizons are gray, strong brown, and reddish brown. These horizons are silty clay or silty clay loam. The C horizons range from gray to grayish brown. They are neutral or in the 2.5Y hue and are mottled with gray, yellowish brown, reddish brown, and red. The C horizons are silty clay or clay.

Armagh soils are closely associated with the poorly drained Brinkerton soils, but Armagh soils have a finer textured B horizon and lack a fragipan. Armagh soils also are associated with the Wharton and Cavode soils, but unlike them, they have dominantly gray colors immediately below the surface. Armagh soils are similar to the Purdy soils but lack stratified silty and clayey material in the lower part of the B horizon and in the C horizons.

In Fayette County, the Armagh soils were mapped only in undifferentiated groups of Brinkerton and Armagh silt loams. These are described under the heading "Brinkerton Series."

Atkins Series

The Atkins series consists of deep, poorly drained, loamy soils that formed in sediments deposited by streams. These nearly level soils are on the flood plains of streams mostly in the eastern part of the county. They occupy the nearly level and slightly depressional parts of the flood plains. Common trees are sycamore, maple, willow, alder, and beech. Cattails, swamp grass, plantain, and ironweed are other common plants.

A typical cultivated Atkins soil has a very dark grayish-brown silt loam plow layer about 7 inches thick. It is faintly mottled. The upper part of the subsoil, between depths of 7 and 16 inches, is olive-gray, friable, prominently mottled sandy clay loam. The lower part of the subsoil extends to a depth of about 42 inches and is dark grayish-brown, friable, stratified silt loam and loam that has distinct gray and brown mottles.

Atkins soils are moderately permeable and have little or no surface runoff. A water table is at or near the surface during periods when wetness is at its peak. Flooding occurs, usually in spring. Tile outlets are difficult to locate in areas of these soils because the soils are low on the landscape. Because of flooding and a high water table, limitations to use for cultivated crops or as building sites are severe.

Representative profile of Atkins silt loam in an idle field along Dunbar Creek one-half mile from the Youghiogheny River:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) silt loam; common, fine, faint, dark grayish-brown (10YR 4/2) mottles; weak, fine, granular structure; very friable, slightly sticky and nonplastic; strongly acid; clear, wavy boundary.

B1g—7 to 16 inches, olive-gray (5Y 4/2) sandy clay loam; common, medium, prominent, yellowish-red (5YR 4/6) and strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few medium root channels; strongly acid; abrupt, wavy boundary.

B2g—16 to 42 inches +, dark grayish-brown (2.5Y 4/2), stratified silt loam and loam; common, medium, distinct, gray (5Y 5/1) and brown (7.5YR 4/4) mottles; weak, medium, subangular blocky structure; friable, nonsticky and nonplastic; strongly acid.

Depth to bedrock ranges from 4 to 15 feet. The solum is more than 42 inches thick. Reaction throughout the profile is strongly acid and very strongly acid. The Ap horizon ranges from very dark grayish brown to grayish brown in a hue of 10YR. In some places there are faint mottles of low chroma in the Ap horizon. The B horizons range from dark gray to light brownish gray and olive gray. Colors of the mottles in the B horizons

include gray, strong brown, and yellowish red. The B horizons are silt loam, loam, or sandy clay loam.

Atkins soils occur in close association with the moderately well drained Philo soils and the very pooly drained Elkins soils. Also nearby are the better drained Monongahela and Chavies soils. The Atkins soils are more acid in the substratum than the similar Melvin soils.

Atkins silt loam (At).—This nearly level soil is in small areas that have an elongated shape. The soil has limitations to use for cultivated crops because of flooding and wetness. Heaving of alfalfa is severe in winter. (Capability unit IIIw-1)

Brinkerton Series

The Brinkerton series consists of deep, poorly drained, loamy soils on upland foot slopes. These soils formed mainly in accumulated materials weathered from clay shale, siltstone, and sandstone. They are nearly level and gently sloping and occur between Chestnut Ridge and Laurel Hill.

Common trees are maple, oak, sycamore, hickory, and yellow-poplar. Other plants are milkweed, ironweed, thistle, and plantain.

A typical cultivated Brinkerton soil has a very dark grayish-brown silt loam plow layer about 8 inches thick. The upper part of the subsoil, between depths of 8 and 29 inches, is light brownish gray, grayish brown, and gray mottled with strong brown and yellowish red. It is silty clay loam that is firm when moist and sticky and plastic when wet. The lower part of the subsoil extends to a depth of about 50 inches and is compact, very firm, gray clay loam mottled with yellowish red.

Brinkerton soils have a slowly permeable fragipan. A water table rises to within 6 inches of the surface at peak wetness. After a heavy rainfall, water remains on the surface for several days. The Brinkerton soils are best suited to crops tolerant of wet soils.

These soils have a good potential for pond sites. Limitations to most uses for engineering and community development are severe because of the slowly permeable fragipan and high water table.

Representative profile of a Brinkerton silt loam in an area of Brinkerton and Armagh silt loams, 0 to 3 percent slopes, in a cultivated field one-half mile southwest of Flatwoods:

Ap—0 to 8 inches, very dark grayish-brown (2.5Y 3/2) silt loam; weak, fine, granular structure; friable, slightly sticky and slightly plastic; very strongly acid; clear, wavy boundary.

B21tg—8 to 15 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, medium, prominent, strong-brown (7.5YR 5/8) mottles; weak, medium, prismatic structure parting to weak, medium, subangular blocky; firm, sticky and plastic; thick, continuous clay films and thick organic coats on prism faces; very strongly acid; abrupt, wavy boundary.

B22tg—15 to 21 inches, grayish-brown (2.5Y 5/2) light silty clay loam; many, medium, prominent, strong-brown (7.5YR 5/8) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; firm, sticky and plastic; thick continuous clay films on prism faces; common, medium, hard, black concretions; very strongly acid; clear, wavy boundary.

B23tg—21 to 29 inches, gray (N 6/0) silty clay loam; common, coarse, prominent, yellowish-red (5YR 5/6) mottles; moderate, coarse, subangular blocky structure; firm, sticky and plastic; thick clay films on prism faces; few, fine, black concretions; very strongly acid; abrupt, wavy boundary.

Bxg—29 to 50 inches +, gray (N 6/0) clay loam; common, coarse, prominent, yellowish-red (5YR 5/8) mottles; moderate, coarse, prismatic structure parting to moderate, very thick, platy; very firm and brittle, slightly sticky and slightly plastic; few, medium, hard, reddish-brown and black concretions; strongly acid.

Depth to bedrock ranges from 5 to 12 feet. Depth to the fragipan ranges from 20 to 30 inches. The colors throughout the soil are neutral or in a hue of 2.5Y or 10YR. The Ap horizon ranges from very dark grayish brown to grayish brown. Above the fragipan, the Bt horizons range from gray to light brownish gray. They are silty clay loam or silt loam. The Bx horizon is gray or grayish brown and is mottled with gray, strong brown, and yellowish red.

Brinkerton soils occur in close association with the Armagh soils, which lack a fragipan, and with the moderately well drained Ernest soils. Also nearby are the Clarksburg and Thorndale soils. The Brinkerton soils are grayer below the Ap horizon than Clarksburg soils and have a more acid substratum than Thorndale soils.

The Brinkerton soils are mapped with Armagh soils in undifferentiated groups. These soils are in similar positions and are similar in drainage and in use and management. Areas contain either Brinkerton or Armagh soils, or both kinds of soils.

Brinkerton and Armagh silt loams, 0 to 3 percent slopes (BaA).—These soils are in concave depressions that receive runoff from higher positions on the landscape. Areas of this mapping unit may contain both Brinkerton and Armagh soils or either Brinkerton or Armagh. Because these soils have similar properties and limitations to use and management, mapping them separately serves no purpose.

These soils have slow permeability. The water table is at or within 6 inches of the surface for several months each year.

Representative profiles of these soils are those described as typical for the Brinkerton series and the Armagh series.

Where outlets are available, tile or open ditches help reduce the length of time a high water table restricts cultivation or grazing. These soils are suited to limited cultivation and long-term hay crops. The slow permeability and high water table are severe limitations to most uses of these soils. (Capability unit IVw-1)

Brinkerton and Armagh silt loams, 3 to 8 percent slopes (BaB).—These soils are in concave areas that receive runoff or seepage from higher positions. Areas contain both Brinkerton and Armagh soils, or either kind of these soils. Because Brinkerton and Armagh soils have similar properties and limitations to use and management, mapping them separately serves no useful purpose.

These soils have slow permeability and a water table is at or within 6 inches of the surface for several months each year. Where the soils are not protected, the erosion hazard is moderate.

In this mapping unit the Brinkerton and Armagh soils have a somewhat thinner and lighter colored surface layer than that described as typical for either series.

Included with these soils in mapping are gently sloping soils that are similar to the Brinkerton soil but are somewhat poorly drained and have a yellowish-brown or strong-brown layer immediately below the surface. Also included are small areas of Cavode silt loam, 3 to 8 percent slopes, moderately eroded.

Tile or open ditches help to reduce the length of time a high water table restricts cultivation or grazing. These soils are suited to long-term hay and limited cultivation. The high water table and slow permeability severely limit these soils for most uses. (Capability unit IVw-1)

Brooke Series

The Brooke series consists of moderately deep, well-drained, loamy soils that have a clayey subsoil and formed in material weathered from limestone and calcareous clay shale. These gently sloping to moderately steep soils occupy rounded hilltops, high areas between hilltops, and upper slopes. Brooke soils are in the western part of Fayette County.

Common trees are black locust, chokecherry, walnut, crab apple, and ash. Other types of vegetation consist of elderberry, sweetclover, plantain, white clover, and bluegrass.

A typical cultivated Brooke soil has a dark-brown silty clay loam plow layer about 8 inches thick. The plow layer is sticky and plastic when wet. The subsoil, extending to a depth of 37 inches, is a strong-brown, firm silty clay and channery silty clay. It is very sticky or sticky and very plastic or plastic when wet. Limestone and calcareous shale begins at a depth of 37 inches.

These soils have slow permeability and high shrink-swell potential. If tilled when wet, the plow layer becomes cloddy and compact. The available moisture capacity is moderate. These soils are neutral; and alfalfa grows well. The Brooke soils have limited potential for use as pond sites and for onsite sewage disposal because permeability is restricted and depth to shale and limestone is moderate.

Representative profile of Brooke silty clay loam, 3 to 8 percent slopes, moderately eroded, in a hayfield 5 miles south of Uniontown.

Ap—0 to 8 inches, dark-brown (7.5YR 3/2) silty clay loam, brown (7.5YR 5/2) when dry; moderate, fine, angular blocky structure; friable to firm, sticky and plastic; 5 percent limestone fragments; neutral; clear, wavy boundary.

B21t—8 to 19 inches, strong-brown (7.5YR 5/6) silty clay; strong, coarse, prismatic structure parting to strong, coarse, angular blocky; firm, very sticky and very plastic; thick continuous clay films on ped faces; 10 percent limestone fragments up to 8 inches in diameter; neutral; gradual, wavy boundary.

B22t—19 to 34 inches, strong-brown (7.5YR 5/8) channery silty clay; strong, coarse, angular blocky structure; firm, sticky and plastic; thick continuous clay films on ped faces; 15 percent limestone fragments up to 10 inches in diameter; neutral; gradual, wavy boundary.

B23t—34 to 37 inches, strong-brown (7.5YR 5/6) channery silty clay; moderate, coarse, prismatic structure parting to strong, coarse, angular blocky; firm, sticky and plastic; thin continuous clay films on ped faces; few black coatings and concretions; 25 percent limestone fragments up to 10 inches in diameter; neutral; abrupt, wavy boundary.

R—37 inches +, thin-bedded, grayish-black limestone and gray calcareous shale.

Depth to bedrock ranges from 20 to 40 inches. The Ap horizon is dark brown or very dark grayish brown. The B horizons are strong brown or yellowish brown. They are channery clay, silty clay, or silty clay loam. Reaction in the lower part of the B horizon ranges from neutral to moderately alkaline.

Brooke soils occur in close association with the deep, well drained Westmoreland soils, the moderately well drained Guernsey soils, and the somewhat poorly drained Library soils.

Brooke silty clay loam, 3 to 8 percent slopes, moderately eroded (BrB2).—This soil has the profile described as typical for the series. The soil occupies rounded hilltops and saddlelike areas between hilltops. In most places the areas are 4 to 12 acres in size. Included in mapping this soil are some small areas of nearly level and severely eroded Brooke soils. Also included are some moderately deep soils that are redder than this Brooke soil.

This soil is suited to crops, and most of it is cultivated. The erosion hazard is moderate and is the main limitation to farm use and management. (Capability unit IIIe-2)

Brooke silty clay loam, 8 to 15 percent slopes, moderately eroded (BrC2).—The profile of this soil has a somewhat thinner subsoil than the profile described as typical. This soil occupies rolling hilltops and upper slopes. The areas are mostly 6 to 15 acres in size. Included with this soil in mapping are some severely eroded areas of Brooke soils. Also included are some soils that have reddish colors.

This soil is mostly cultivated. It is suited to hay and to an occasional row crop. The hazard of erosion is the main limitation to farm use and management and is severe where this soil is cultivated. (Capability unit IVe-3)

Brooke silty clay loam, 15 to 25 percent slopes, moderately eroded (BrD2).—This soil is on upper slopes in areas that are about 7 to 15 acres in size. The profile of this soil has a thinner surface layer and is more shallow to bedrock than the profile described as typical for the Brooke series.

Included with this soil in mapping are some severely eroded areas of Brooke soils and some reddish soils. A few small landslips or landslides are in some areas of this soil.

This soil is farmed in most areas. It is best suited to pasture. The hazard of erosion is very severe in cultivated areas and is the main limitation for farming. (Capability unit VIe-2)

Buchanan Series

The Buchanan series consists of deep, moderately well drained, loamy soils that formed in colluvial material weathered from sandstone and shale. These soils are stony and have a compact fragipan in the lower part of the subsoil. They generally occupy the slightly concave base slopes of Chestnut Ridge and Laurel Hill. Buchanan soils are nearly level to moderately steep. Common trees are maple, red oak, beech, and yellow-poplar.

A typical wooded Buchanan soil has a thin, black mat of organic material underlain by a dark grayish-brown to yellowish-brown loam to gravelly fine sandy loam surface layer about 10 inches thick. This layer contains many stones and boulders. Between depths of 10 and 27 inches, the subsoil is brownish-yellow and light yellowish-brown, friable channery loam mottled in the lower part with light gray and strong brown. At a depth of 27 inches is mottled brown, extremely firm and compact channery loam.

Buchanan soils have a thick, slowly permeable fragipan that begins at a depth of about 18 to 34 inches. A seasonal high water table rises to within 1½ feet of the surface when wetness is at its peak. The available moisture capacity is moderate. Stones on and in the surface layer make the farming of intertilled crops impractical.

Buchanan soils are mostly in trees. The main limitation to farm use and management is stoniness. The uses of

Buchanan soils for onsite sewage disposal is severely limited by the slowly permeable fragipan.

Representative profile of Buchanan very stony loam, 8 to 25 percent slopes, in an area 1 mile west of Wharton Furnace:

O1—1½ inches to 1 inch, deciduous leaf litter.
O2—1 inch to 0, black organic matter.
A11—0 to 3 inches, dark grayish-brown (10YR 4/2) loam; very weak, fine, granular structure; very friable, nonsticky and nonplastic; 15 percent gravel and 25 percent stones 1 to 2 feet in size; extremely acid; abrupt, smooth boundary.
A12—3 to 7 inches, brown to dark-brown (10YR 4/3) loam; very weak, fine, granular structure; very friable, nonsticky and nonplastic; 5 percent gravel and 25 percent stones 1 to 2 feet in size; extremely acid; abrupt, smooth boundary.
A2—7 to 10 inches, yellowish-brown (10YR 5/4) gravelly fine sandy loam; weak, fine and medium, granular structure; very friable, nonsticky and nonplastic; 20 percent gravel; extremely acid; abrupt, clear boundary.
B21t—10 to 16 inches, brownish-yellow (10YR 6/6) channery loam; weak, medium, angular blocky structure; friable, slightly sticky and slightly plastic; very thin continuous clay films on ped faces; 15 percent sandstone fragments; very strongly acid; clear, wavy boundary.
B22t—16 to 27 inches, light yellowish-brown (10YR 6/4) channery loam; many, coarse, distinct, light-gray or gray (10YR 6/1) and strong-brown (7.5YR 5/8) mottles; moderate, medium and coarse, angular blocky structure; friable, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 20 percent sandstone fragments; very strongly acid; abrupt, wavy boundary.
Bx—27 to 42 inches, brown (7.5YR 5/4) channery loam; many, coarse, prominent, gray (N 6/0) mottles; weak, coarse, prismatic structure; extremely firm, nonsticky and nonplastic; 15 percent sandstone fragments of which a few are 18 inches thick; very strongly acid.

Depth to bedrock is more than 5 feet. The solum ranges from 40 to 60 inches in thickness. Both angular and thin flat fragments occur and range from 5 to 25 percent by volume. Stones are on the surface and in the soil. The A1 horizons range from very dark brown to dark grayish brown, and the A2 horizon from brown to yellowish brown. These horizons are in hue of 10YR. The Bt horizons range from brownish yellow to brown. Gray, grayish-brown, and strong-brown mottles are common in the Bt horizons. The texture of the Bt horizons centers on channery loam and ranges to channery sandy clay loam. The Bx horizon ranges from brown to reddish yellow. It is channery sandy clay loam, channery loam, or channery clay loam.

The Buchanan soils occur in close association with the poorly drained Andover soils. Buchanan soils also are near the Dekalb and Cookport soils, but the Buchanan soils are deeper to bedrock than these soils and have a fragipan that is absent in the well-drained Dekalb soils.

Buchanan very stony loam, 0 to 8 percent slopes (BuB).—The profile of this soil has a thicker, darker colored surface layer than the one described as typical for the series. Included in mapping are small areas of a well-drained soil that has a fragipan deep in the subsoil. This soil is suited to pasture. (Capability unit VIs–2)

Buchanan very stony loam, 8 to 25 percent slopes (BuD).—This soil has the profile described as typical for the series. Where disturbed, this soil is very susceptible to erosion. Included in mapping are small areas of well-drained soils that have a fragipan deep in the subsoil. Because this soil is steeper than Buchanan very stony loam, 0 to 8 percent slopes, limitations to use of woodland equipment are more severe. (Capability unit VIs–2)

Cavode Series

The Cavode series consists of deep, somewhat poorly drained soils that have a clayey subsoil. These soils of the uplands formed in material weathered from siltstone and clay shale. They are nearly level to gently sloping on broad ridges and are sloping to moderately steep in other areas. Most areas of Cavode soils are east of U.S. Highway No. 119. Common trees are red oak, red maple, sycamore, redbud, ash, and elm. Other plants are elderberry, blackberry, ironweed, plantain, and milkweed.

A typical cultivated Cavode soil has a dark grayish-brown silt loam plow layer about 7 inches thick. The subsoil, between depths of 7 to 43 inches, is mottled, brown, firm silty clay loam to a depth of 12 inches and, below that depth, is mottled light yellowish-brown and light brownish-gray, firm silty clay. When wet the subsoil is sticky and plastic or very sticky and very plastic. At a depth of 43 inches is mottled gray, very firm silty clay. It is massive and is very sticky and very plastic when wet.

The Cavode soils have slow permeability. A water table rises to within 6 to 18 inches of the surface when wetness is at its peak. These soils erode easily and are gullied and seepy in many small areas. They are strongly acid to very strongly acid. The natural fertility is low, and the available moisture capacity is moderate.

Cavode soils are mostly farmed and are suited to limited cultivation and to hay. Hay mixtures tolerant of wet soils grow well. Use for onsite disposal of sewage is severely limited because permeability is slow.

Representative profile of Cavode silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field 3 miles southeast of Ohiopyle:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable, slightly sticky and slightly plastic; strongly acid; abrupt, smooth boundary.
B21t—7 to 12 inches, brown (10YR 5/3) silty clay loam; few, medium, faint, gray (10YR 6/1) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin continuous clay films on ped faces; strongly acid; clear, smooth boundary.
B22t—12 to 23 inches, light yellowish-brown (10YR 6/4) silty clay; many, coarse, distinct, light-gray (10YR 7/1) mottles and common, medium, distinct, yellowish-red (5YR 5/6) mottles; moderate, medium and coarse, subangular blocky structure; firm, very sticky and very plastic; thick continuous clay films on ped faces; strongly acid; clear, smooth boundary.
B23tg—23 to 43 inches, light brownish-gray (10YR 6/2) silty clay; many, coarse, faint, light-gray (10YR 7/1) mottles and common, coarse, distinct, yellowish-red (5YR 5/6) mottles; moderate, coarse, subangular blocky structure; firm, very sticky and very plastic; thick continuous clay films on ped faces; strongly acid; abrupt, smooth boundary.
Cg—43 to 60 inches +, gray (10YR 6/1) silty clay; reddish-brown (5YR 4/4) mottles and strong-brown (7.5YR 5/6) streaks; massive; very firm, very sticky and very plastic; very strongly acid.

Depth to bedrock is about 3½ to 6 feet. The solum ranges from about 40 to 50 inches in thickness. Colors throughout the profile are in hues of 10YR or 2.5Y. The color of the Ap horizon centers on dark grayish brown and ranges from very dark grayish brown to brown. The Bt horizons are brown, light yellowish brown, or yellowish brown in the upper part and are gray, grayish brown, or light brownish gray in the lower part. Mottle colors in the Bt horizons are light gray, gray, strong brown (7.5YR 5/6), and yellowish red (5YR 5/6).

Texture is silty clay or silty clay loam. The C horizon ranges from gray to light gray.

The poorly drained Cavode soils occur in close association with the shallow, well drained Weikert soils; the moderately deep, well drained Gilpin soils; the moderately well drained Wharton soils; and the poorly drained Armagh soils.

Cavode soils also occur closely with the Ernest and Brinkerton soils. They have more clay in the B horizon than do the Ernest and Brinkerton soils and lack the fragipan that occurs in those soils. Cavode soils are near the Guernsey and Library soils in some places. They are more poorly drained than those soils and have a more acid B horizon with lower base saturation.

Cavode silt loam, 3 to 8 percent slopes, moderately eroded (CaB2).—This soil has the profile described as representative for the series. The areas mapped are mostly 4 to 20 acres in size. The soil occupies broad hilltops. Included in mapping are small areas of nearly level Cavode soils and areas of severely eroded soils.

Surface runoff and internal drainage are slow. This soil is mostly cultivated, and it is suited to limited use for row crops. The main limitation to farm use is wetness. (Capability unit IIIw-2)

Cavode silt loam, 8 to 15 percent slopes, moderately eroded (CaC2).—Areas of this soil are about 8 to 25 acres in size. They occupy rolling hilltops and slopes. The profile of this soil has a thinner, lighter colored surface layer than has the profile described as typical for the series. Some severely eroded Cavode soils are included in areas mapped as this soil.

This soil is mostly cultivated, but it is suited to only limited use for row crops because of the severe erosion hazard. The main limitation to farm use is erosion. (Capability unit IIIe-3)

Cavode silt loam, 15 to 25 percent slopes, moderately eroded (CaD2).—This soil occupies side slopes of rolling and hilly areas. In its profile the surface layer is thinner and lighter colored than that in the profile described as typical for the Cavode series. Included with this soil in mapping are small areas of severely eroded Cavode soils and areas of Wharton soils.

Surface runoff is rapid to medium, and internal drainage is slow. The erosion hazard is very severe.

This soil is mostly cultivated, though it is suited to only limited use for row crops. It is better suited to hay. The main limitation to use for farming is erosion. (Capability unit IVe-2)

Cavode very stony silt loam, 0 to 8 percent slopes (CdB).—This soil occupies broad areas on hilltops. Many stones and boulders, a foot to several feet in diameter, are on the surface. Unlike the soil that has the profile described as typical for the series, this soil has a thin leaf mulch and a thin surface layer rich in organic matter. Surface runoff and internal drainage are slow. This soil is primarily wooded, but it is suited to pasture. The main limitations are stoniness and wetness. (Capability unit VIs-2)

Cavode very stony silt loam, 8 to 25 percent slopes (CdD).—This soil occupies the side slopes of rolling and hilly areas. Many stones and boulders, a foot to several feet in diameter, are on the surface. Unlike the soil that has the profile described as typical for the series, this soil has a thin, dark-colored surface layer rich in organic matter. Surface runoff is medium, and internal drainage is slow. The erosion hazard is very severe where this soil is disturbed. This soil is mostly wooded, but it is suited to pasture. The main limitations are stoniness and slope. (Capability unit VIs-2)

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Chavies Series

The Chavies series consists of deep, well-drained, loamy soils on stream terraces. These soils formed in water-deposited sediments on high bottom land along the rivers and larger creeks of the county. These soils are nearly level and have a smooth to slightly convex surface.

A typical cultivated Chavies soil has a dark-brown fine sandy loam plow layer about 9 inches thick. The subsoil, between depths of 9 and about 70 inches, is friable, dark-brown and yellowish-brown fine sandy loam to silt loam. The underlying material is very gravelly loam.

Chavies soils have moderately rapid permeability and a high available moisture capacity. Surface runoff is medium, internal drainage is rapid, and the erosion hazard is slight. The water table is lower than 3 feet from the surface, and bedrock normally is at a depth of 5 to 12 feet. The Chavies soils have good tilth, and they are easily worked.

Chavies soils are suited to general farm crops, truck crops, and alfalfa. In most places they are cultivated or in community development. These soils are poorly suited as sites for ponds. Limitations for most community development are none to slight.

Representative profile of Chavies fine sandy loam in a nearly level idle field, between Whitsett and Youghiogheny River; profile S64–Pa–26–3 (1–9) in tables 10 and 11 in the section "Laboratory Data":

Ap—0 to 9 inches, dark-brown (7.5YR 3/2) fine sandy loam; weak, fine, granular structure; friable, nonsticky and nonplastic; extremely acid; abrupt, smooth boundary

B21—9 to 17 inches, dark-brown (7.5YR 4/4) fine sandy loam; weak, medium, subangular blocky structure; friable, nonsticky and nonplastic; clay bridging of some sand grains; strongly acid; gradual, wavy boundary.

B22t—17 to 23 inches, brown (7.5YR 5/4) fine sandy loam; moderate, medium and fine, subangular blocky structure; friable, slightly sticky and nonplastic; thin clay bridging of sand grains; strongly acid; gradual, wavy boundary.

B23t—23 to 34 inches, brown (7.5YR 5/4) very fine sandy loam; weak, fine and medium, subangular blocky structure; friable, slightly sticky and nonplastic; thin clay bridging of sand grains; medium acid; gradual, wavy boundary.

B24—34 to 43 inches, brown (7.5YR 5/4) very fine sandy loam; weak, medium, subangular blocky structure; friable, slightly sticky and nonplastic; thin, partial clay bridging of sand grains; common, thin coats of iron and manganese; medium acid; gradual, wavy boundary.

B25—43 to 54 inches, brown (7.5YR 5/4) and yellowish-brown (10YR 5/4) silt loam; moderate, medium and coarse, angular blocky structure; friable, slightly sticky and slightly plastic; thin, partial clay bridging of sand grains; common, thin coats of iron and manganese; 1 percent cobblestones; medium acid; clear, wavy boundary.

B26—54 to 58 inches, dark-brown (7.5YR 4/4) loam; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; common, thin coats of iron and manganese; 1 percent cobblestones; medium acid; gradual, wavy boundary.

B3—58 to 70 inches, dark-brown (7.5YR 4/4) fine sandy loam; weak, coarse, subangular blocky structure; friable, slightly sticky and slightly plastic; many iron and manganese concretions and coatings; 5 to 10 percent gravel; medium acid; abrupt, irregular boundary.

C—70 to 72 inches +, dark-brown (7.5YR 4/4) very gravelly loam or sandy loam; weak, coarse, subangular blocky structure; friable, slightly sticky and slightly plastic; 60 percent gravel; medium acid.

Depth to bedrock ranges from 5 to 12 feet or more. The solum is 50 to 72 inches thick, but the lower boundary of the Bt horizon is within 40 inches of the surface. Throughout the profile, color is in hues of 10YR and 7.5YR. The Ap horizon ranges from dark grayish brown to brown. The B horizons center on brown and ranges from dark brown to yellowish brown. Textures are mostly loam, silt loam, and fine sandy loam, and the lower B horizons are commonly gravelly. The C horizon is mostly dark brown or brown. It ranges from gravelly or very gravelly fine sandy loam to gravelly or very gravelly loamy sand. The content of gravel ranges from 20 to 70 percent in the C horizon.

Chavies soils occur in close association with the Allegheny and Monongahela soils. Chavies soils have less clay in the B horizon than the Allegheny soils and are better drained and lack the fragipan of the Monongahela soils.

Chavies fine sandy loam (Ce).—This nearly level soil occurs in areas about 10 to 20 acres in size. Included with this soil in mapping are a few small areas of a soil that is mottled in the lower part of the subsoil. Chavies fine sandy loam is suited to intensive farming. (Capability unit I–1)

Clarksburg Series

The Clarksburg series consists of deep, moderately well drained to somewhat poorly drained, loamy soils that have a fragipan. These soils formed in materials weathered from sandstone and shale limestone that accumulated at the base of steeper slopes. The Clarksburg soils are nearly level to moderately steep and occur in the western part of the county where the soil surface is concave. They are associated with the coal-bearing measures of Fayette County. Common trees are black locust, black walnut, chokecherry, yellow-poplar, red oak, red maple, crab apple, and ash. Other plants are elderberry, blackberry, ironweed, milkweed, plantain, thistle, and dandelion.

A typical cultivated Clarksburg soil has a dark grayish-brown silt loam plow layer about 8 inches thick. The next layer is 2 inches of dark yellowish-brown silt loam. The subsoil above the fragipan, between depths of 10 and 37 inches, is brown clay loam and firm, mottled, pale-brown loam. The fragipan extends to a depth of 56 inches and is very firm, brittle, and compact. It is strong-brown loam that has distinct gray mottles. The underlying material is firm, prominently mottled, yellowish-red loam.

A slowly permeable fragipan impedes root penetration and water movement. Natural fertility is high, and the available moisture capacity is moderate. Heaving is severe in winter. These soils are suited to farming and are cultivated in most places. The limitations to use for onsite sewage disposal are severe.

Representative profile of a Clarksburg silt loam in an area of Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded, in a cultivated field 1 mile east of Collier:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, granular structure; friable, slightly sticky and slightly plastic; very strongly acid; abrupt, wavy boundary.

A2—8 to 10 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, thin and medium, platy structure; friable, slightly sticky and slightly plastic; slightly acid; clear, wavy boundary.

B21t—10 to 18 inches, brown (7.5YR 5/4) clay loam; weak, medium and coarse, subangular and angular blocky structure; firm, sticky and plastic; thin continuous clay films; slightly acid; gradual, wavy boundary.

B22t—18 to 37 inches, pale-brown (10YR 6/3) heavy loam; few yellowish-red (5YR 5/8) mottles and common, coarse, faint, gray (10YR 6/1) mottles; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm, slightly sticky and slightly plastic; thick continuous clay films on prism and ped faces; medium, common, black concretions; medium acid; gradual, wavy boundary.

Bx—37 to 56 inches, strong-brown (7.5YR 5/8) loam; common, medium, distinct, gray (10YR 6/1) mottles; weak, coarse, prismatic structure parting to weak, very thick, platy; very firm and brittle, slightly sticky and slightly plastic; very thick continuous clay films on prism faces, thick continuous clay films on plates; medium, black concretions; medium acid; diffuse, wavy boundary.

C—56 to 66 inches +, yellowish-red (5YR 4/8) loam; common, medium, prominent, gray (10YR 6/1) mottles; weak, coarse, subangular blocky structure; firm, slightly sticky and slightly plastic; common, medium, black concretions; medium acid.

Depth to bedrock ranges from 4 to 10 feet. The solum is 40 to 60 inches thick. Depth to mottles of low chroma centers on the upper 10 inches of the Bt horizon and ranges from 16 to 30 inches. The Ap horizon ranges from very dark grayish brown to brown. The Bt horizons range from brown to light brown and are loam, clay loam, or silty clay loam. The C horizon ranges from strong brown to yellowish red. It is loam, clay loam, or silt loam.

Clarksburg soils are closely associated with the Guernsey soils and also occur with the poorly drained to somewhat poorly drained Thorndale soils. Clarksburg soils are also near the Westmoreland and Library soils. The Clarksburg soils have a fragipan, whereas the Westmoreland, Guernsey, and Library soils do not. They also are more poorly drained than the Westmoreland soils and have less clay in the B horizon than the Guernsey and Library soils.

In Fayette County the Clarksburg soils were mapped only in complexes with the Guernsey soils. Guernsey soils are described under the heading "Guernsey Series."

Clarksburg-Guernsey silt loams, 2 to 8 percent slopes (CgB).—This mapping unit is a complex of Clarksburg and Guernsey soils. The Clarksburg soil makes up about 60 percent of the mapping unit, and the Guernsey soils about 40 percent. These soils normally occupy areas below Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded. The areas ordinarily are 6 to 20 acres in size.

This mapping unit consists of areas in which both the Clarksburg and the Guernsey soils have a thicker, darker colored surface layer than is typical for their respective series. Included with these soils in mapping are a few small areas of severely eroded soils.

This soil is suited to intensive use for row crops, though the erosion hazard is moderate. Most areas are in pasture or are cultivated. Many houses and other buildings are on this unit because the soils are gently sloping and generally accessible. (Capability unit IIe–2)

Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded (CgC2).—This mapping unit is a complex of Clarksburg and Guernsey soils. The Clarksburg soil makes up about 60 percent of the mapping unit, and the Guernsey soil about 40 percent. The profiles of these soils are those described as typical for their respective series. These soils occupy foot slopes. The areas mapped are mostly 8 to 20 acres in size. Included in mapping are some small areas of soils that are severely eroded and a few very small areas of deep soils that have better

drainage than the soils in this complex and some that have poorer drainage.

These soils are suited to moderate use for row crops, though the erosion hazard is severe. Most areas are in pasture or are cultivated. (Capability unit IIIe-3)

Clarksburg-Guernsey silt loams, 15 to 25 percent slopes, moderately eroded (CgD2).—This mapping unit is a complex of Clarksburg and Guernsey soils. The Clarksburg soil makes up about 60 percent of the unit, and Guernsey soil about 40 percent. These soils occupy foot slopes below steeper soils. The areas are mostly 8 to 20 acres in size. The profiles of these soils have a lighter colored surface layer and lower organic-matter content than the profiles described as typical of the Clarksburg and Guernsey series. They also have a somewhat thinner subsoil. Surface runoff is medium to rapid, and the erosion hazard is very severe.

These soils are suited to hay and to limited use for row crops. Most areas are cultivated. (Capability unit IVe-2)

Clymer Series

The Clymer series consists of deep, well-drained, loamy soils that formed in materials weathered from sandstone and shale bedrock. These gently sloping to moderately steep soils occupy broad areas on hills, ridgetops, and upper slopes in the western part of Fayette County. Slopes normally are convex. Some of the Clymer soils are very stony. Common trees are red oak, maple, sassafras, dogwood, yellow-poplar, and ash.

A typical cultivated Clymer soil has a brown channery loam plow layer about 7 inches thick. The subsoil, between depths of 7 and about 36 inches, is friable, yellowish-brown loam and sandy loam containing many flat fragments of sandstone. The underlying material extends to a depth of 60 inches and is yellowish-brown very channery sandy loam. Thin-bedded, yellowish-brown sandstone is at a depth of about 60 inches.

Clymer soils have moderately rapid permeability and a moderate available moisture capacity. Natural fertility is moderate to low. The water table is lower than 3 feet, and bedrock normally is 3½ to 7 feet below the surface. The Clymer soils have good tilth and can be easily worked where stones do not interfere. They are strongly acid to very strongly acid in unlimed areas. Very stony areas of these soils are not suited to row crops, but these areas can be used for pasture. Where surface stones are removed, these soils are suited to alfalfa, corn, potatoes, and orchard crops. Clymer soils are poorly suited as sites for ponds.

Representative profile of Clymer channery loam, 3 to 12 percent slopes, moderately eroded, in a cultivated field 1 mile west of the town of Mill Run:

Ap—0 to 7 inches, brown (10YR 4/3) channery loam; weak, fine and medium, granular structure; very friable, slightly sticky and nonplastic; 20 to 25 percent coarse fragments; medium acid; abrupt, smooth boundary.

B21t—7 to 15 inches, yellowish-brown (10YR 5/8) channery heavy loam; weak, fine and medium, subangular blocky structure; friable, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 20 percent coarse fragments; strongly acid; clear, wavy boundary.

B22t—15 to 32 inches, yellowish-brown (10YR 5/8) channery loam; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 25 to 30 percent coarse fragments; strongly acid; clear, wavy boundary.

B3—32 to 36 inches, yellowish-brown (10YR 5/6) channery sandy loam; weak, medium and coarse, subangular blocky structure; very friable, nonsticky and nonplastic; very thin patchy clay films on ped faces; 40 percent coarse fragments; very strongly acid; gradual, wavy boundary.

C—36 to 60 inches, yellowish-brown (10YR 5/6) very channery sandy loam; weak, fine, granular structure; very friable, nonsticky and nonplastic; 60 to 70 percent coarse fragments; very strongly acid; abrupt, wavy boundary.

R—60 inches +, yellowish-brown (10YR 5/8), thin-bedded sandstone.

Depth to bedrock ranges from 3½ to 7 feet. The solum is 30 to 40 inches thick. The B horizons are yellowish brown or brownish yellow. They are sandy loam, loam, fine sandy loam, or clay loam, or are channery analogues of these textures. The C horizon is yellowish brown and brownish yellow and is very channery or channery sandy loam or loam.

Clymer soils occur in close association with Hazleton, Dekalb, and Cookport soils and occur with Gilpin soils in some places. The Clymer soils have a B2t horizon that is absent in Hazleton soils. In the Clymer soils bedrock is deeper than in the Dekalb soils and drainage is better than in the Cookport soils. Clymer soils have less silt and more sand in the B horizon than Gilpin soils and are deeper to bedrock.

Clymer channery loam, 3 to 12 percent slopes, moderately eroded (ClB2).—The profile of this soil is the one described as typical for the series. The soil occupies broad hills and ridgetops. The areas mapped generally are 15 to 25 acres in size. Included with this soil in mapping are a few small areas of nearly level Clymer soils. This soil is mostly cultivated, and it is suited to intensive use for row crops. The limitations to use for onsite sewage disposal are slight. (Capability unit IIe-1)

Clymer channery loam, 12 to 20 percent slopes, moderately eroded (ClC2).—This soil occupies hilltops and upper slopes. The areas mapped range from 8 to 20 acres in size. The profile of this soil has a thinner surface layer than the one described as representative of the Clymer series. Included with this soil in the mapping are a few small areas of Clymer soils that are severely eroded and some areas that are steeper than this soil.

This soil is suited to use as cropland if it is protected from erosion. Most of it is cultivated. The limitations to use for onsite sewage disposal are moderate. (Capability unit IIIe-1)

Clymer very stony loam, 0 to 12 percent slopes (CmB).—This soil occupies broad hills and ridgetops. The areas mapped are mostly 20 to 40 acres in size. This soil has many surface stones 1 to 8 feet in size. Unlike the profile described as typical for the series, the profile of this soil has a thin layer of leaf litter and black organic matter above the mineral soil. This soil is mostly wooded, but it is also suited to pasture. The limitations to use for onsite sewage disposal are slight. (Capability unit VIs-1)

Clymer very stony loam, 12 to 30 percent slopes (CmD).—This soil occupies the upper slopes of hillsides. The areas mapped are mostly 20 to 40 acres in size. Many stones, 1 to 6 feet in size, are on the surface. Unlike the profile described as typical for the series, the profile of this soil has a thin layer of leaf litter and black organic matter above the mineral soil. Included with this soil in the mapping are small areas of Dekalb very stony loam, 12 to 30 percent slopes.

Most of this Clymer soil is woodland, but pasture is also suited. The limitations to use for onsite sewage disposal are severe. (Capability unit VIs–1)

Cookport Series

The Cookport series consists of deep, moderately well drained, loamy soils that developed in material weathered in place from acid shale and sandstone bedrock. In many areas these nearly level to moderately steep soils have a very stony surface layer. Cookport soils commonly occupy concave positions in drainage divides and the broad tops of hills and ridges in the western part of the county. Common trees are yellow-poplar, red oak, elm, beech, and maple.

A typical cultivated Cookport soil has a dark grayish-brown loam plow layer about 7 inches thick. The upper part of the subsoil, between depths of 7 and 25 inches, is brown and yellowish-brown silty clay loam. It is friable to firm and has distinct, light-gray mottles at a depth of 15 inches. The yellowish-brown clay loam lower part of the subsoil extends to a depth of 38 inches and is a very firm, brittle, compact fragipan. It has distinct, gray and reddish-brown mottles. The light-brown and light yellowish-brown underlying material extends to a depth of 49 inches and is sandy clay loam that has many fragments of sandstone in the lower part. Grayish-brown, thin-bedded sandstone bedrock is at a depth of 49 inches.

Cookport soils have slow permeability and a moderate available moisture capacity. The water table is within 1½ feet of the surface during wet periods. Bedrock normally is from 3½ to 5 feet below the surface. Where unlimed these soils are strongly acid to very strongly acid. The limitations to use for onsite sewage disposal are severe.

Representative profile of Cookport loam, 3 to 8 percent slopes, moderately eroded, in a pasture 3 miles southeast of Haydentown:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) loam; weak, medium and fine, granular structure; friable, slightly sticky and slightly plastic; a few fine roots; 10 percent sandstone fragments; strongly acid; abrupt, smooth boundary.

B21t—7 to 15 inches, brown (10YR 5/3) light silty clay loam; weak, fine and medium, subangular blocky structure; friable to firm, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 10 percent sandstone fragments; strongly acid; clear, smooth boundary.

B22t—15 to 25 inches, yellowish-brown (10YR 5/4) silty clay loam; common, coarse, distinct, light-gray (10YR 6/1) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thick continuous clay films on ped faces; very strongly acid; abrupt, smooth boundary.

Bx—25 to 38 inches, yellowish-brown (10YR 5/6) clay loam; many, coarse, distinct, light-gray or gray (10YR 6/1) mottles and common, coarse, distinct reddish-brown (5YR 5/3) mottles; weak, coarse, prismatic structure; very firm and brittle, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 12 to 15 percent coarse fragments; very strongly acid; clear, smooth boundary.

C1x—38 to 42 inches, light-brown (7.5YR 6/4) sandy clay loam; many, coarse, distinct, light-gray or gray (10YR 6/1) and common, coarse, distinct, light-red (2.5YR 6/6) mottles; massive; extremely firm and brittle, slightly sticky and nonplastic; 12 to 15 percent coarse fragments; very strongly acid; abrupt, smooth boundary.

C2—42 to 49 inches, light yellowish-brown (10YR 6/4) very channery sandy clay loam; 70 percent coarse fragments; very strongly acid; abrupt, wavy boundary.

R—49 inches +, grayish-brown, thin-bedded sandstone.

Depth to bedrock ranges from 3½ to 5 feet. The solum is 25 to 40 inches thick. Mottles of low chroma are 14 to 30 inches from the surface, but they center on 16 inches. The Ap horizon is dark grayish brown or grayish brown, and the Bt horizons are brown or yellowish brown. Mottles of high chroma, where present, are in hues of 7.5YR to 5YR and have values of 4 to 6. The Bt horizons are clay loam, silty clay loam, or loam. The top of the Bx horizon is 18 to 26 inches from the surface. Color of the Bx horizon centers on a hue of 10YR, value of 4 or 5, and chroma of 2 to 6. This horizon is clay loam or loam. The Cx horizon ranges from light brown to light grayish brown in color and is sandy clay loam or loam in texture.

Cookport soils occur in close association with Clymer, Hazleton, and Dekalb, all of which are well drained and lack a fragipan. Nearby are the Andover, Buchanan, and Brinkerton soils. Cookport soils are better drained than the Andover and Brinkerton soils, and they are shallower to bedrock than the Buchanan soils.

Cookport loam, 0 to 3 percent slopes (CoA).—This soil is on the broad tops of hills and mountains in areas that range from about 4 to 10 acres in size. The erosion hazard is slight. The profile of this soil has a thicker, darker colored surface layer than has the profile described as representative of the Cookport series.

Included with this soil in mapping are small areas of Cookport loam, 3 to 8 percent slopes, moderately eroded, and some poorly drained soils that have silt loam surface layer and a coarser textured subsoil than this soil. In addition, a few areas of very poorly drained soils are included.

This soil is suited to crops. Much of it is cultivated, but some is wooded. (Capability unit IIw–2)

Cookport loam, 3 to 8 percent slopes, moderately eroded (CoB2).—The profile of this soil is the one described as typical for the series. The soil occupies broad tops of hills and mountains and is in drainage divides. Areas are 8 to 20 acres in size. Included with this soil in mapping are a few small areas of Cookport soils that are slightly eroded. Small areas of poorly and very poorly drained soils are also included.

This soil is suited to cultivation, but, where farmed, is moderately susceptible to erosion. Most of this soil is in pasture or trees. (Capability unit IIe–2)

Cookport loam, 8 to 15 percent slopes, moderately eroded (CoC2).—This soil occupies drainage divides and the lower lying concave slopes. The areas are mostly 8 to 20 acres in size. The profile of this soil has a thinner, lighter colored surface layer than the one described as typical for the Cookport series. Included with this soil in mapping are small areas of Cookport soils that are severely eroded. Some small areas of steeper soils also occur in the areas mapped.

This soil is suited to cultivated crops, but it is severely susceptible to erosion where cultivated. Most of this soil is in pasture or trees. (Capability unit IIIe–3)

Cookport very stony loam, 0 to 8 percent slopes (CpB).—This soil occupies the broad tops of hills and mountains and is in drainage divides. Areas are mostly 10 to 30 acres in size. The stones are a foot to several feet in diameter and are numerous enough to interfere with the cultivation of row crops. The stones, however, are not numerous enough to interfere with use for pasture. The profile of this soil has a thin, dark-colored organic mat on the surface, but the profile described as typical for the

series does not. This soil is suited to pasture, but most areas are in trees. (Capability unit VIs–2)

Cookport very stony loam, 8 to 25 percent slopes (CpD).—This soil occupies drainage divides and the higher lying slopes. Areas are mostly 20 to 40 acres in size. Stones on this soil are a foot to several feet in diameter and are numerous enough to interfere with the cultivation of row crops. The stones, however, are not numerous enough to interfere with use for pasture. The profile of this soil has a thin, dark-colored organic mat on the surface, but the profile described as typical for the series does not. This soil is suited to pasture but is mostly in trees. (Capability unit VIs–2)

Dekalb Series

The Dekalb series consists of moderately deep, well-drained, loamy soils that developed in material weathered in place from sandstone and some conglomerate and shale bedrock. These nearly level to very steep soils are in the stony, mountainous area of the eastern part of the county. Slopes normally are slightly convex. Common trees are red oak, chestnut oak, maple, dogwood, sassafras, and black birch. Mountain laurel, teaberry, groundpine, greenbrier, and moss are in the understory.

A typical wooded Dekalb soil has about a 3½-inch mat of leaf litter and black organic matter covering the surface. The surface layer is very dark grayish-brown and yellowish-brown sandy loam about 8 inches thick. This layer contains many stones. The subsoil, between depths of 8 and 24 inches, is yellowish-brown loam and sandy loam containing many flat fragments of sandstone. The underlying material is yellowish-brown very channery sandy loam. Grayish-brown, hard sandstone bedrock is at a depth of about 34 inches.

Dekalb soils have rapid permeability and internal drainage. Natural fertility and the available moisture capacity are low. The water table is more than 3 feet from the surface. Depth to bedrock ranges from 24 and 42 inches. Stones and boulders are a foot to several feet in diameter in very stony areas. These soils normally are strongly acid or very strongly acid. Most areas are in trees. Dekalb soils are poorly suited as sites for ponds.

Representative profile of Dekalb very stony sandy loam, 12 to 30 percent slopes, in a wooded area southeast of Springhill:

O1—3½ to 2 inches, hardwood leaf litter.

O2—2 inches to 0, black, partly decomposed leaf litter.

A1—0 to 2 inches, very dark grayish-brown (2.5Y 3/2) sandy loam; weak, fine, granular structure; very friable, nonsticky and nonplastic; 12 percent coarse fragments; very strongly acid; abrupt, smooth boundary.

A2—2 to 8 inches, yellowish-brown (10YR 5/4) sandy loam; weak, thin, platy structure; very friable, nonsticky and nonplastic; 12 percent coarse fragments; very strongly acid; clear, smooth boundary.

B21—8 to 14 inches, yellowish-brown (10YR (5/6) channery loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; thin patchy silt coatings; 25 percent coarse fragments; very strongly acid; clear, wavy boundary.

B22—14 to 24 inches, yellowish-brown (10YR 5/6) very channery sandy loam; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few, thin, patchy clay films on ped faces; 55 percent coarse sandstone fragments; very strongly acid; gradual, wavy boundary.

C—24 to 34 inches, yellowish-brown (10YR 5/4) very channery sandy loam; weak, fine, subangular blocky structure that generally is obscured by coarse fragments; very friable, nonsticky and nonplastic; 60 percent coarse fragments of sandstone; very strongly acid; abrupt, smooth boundary.

R—34 inches +, flaggy, hard, grayish-brown sandstone.

Depth to bedrock ranges from 2 to 3½ feet. The solum is 18 to 30 inches thick. The A2 horizon is yellowish brown or brown and has a texture of sandy loam or loam. The B horizons are yellowish brown or brownish yellow and are channery and very channery sandy loam or loam. Sandstone fragments range from 20 to 65 percent, by volume, in the B horizons. The C horizon is brownish yellow or yellowish brown. It is loam, sandy loam, or loamy sand and is 40 to 90 percent sandstone fragments.

The moderately deep Dekalb soils occur in close association with the deep, well drained Hazleton and Clymer and with the moderately well drained Cookport soils. In some places Dekalb soils occur with Gilpin soils but have a subsoil that contains more sand and less silt.

Dekalb channery loam, 30 to 60 percent slopes (DaF).—This soil is on the slopes of mountains and hills. Most of the areas are 20 to 50 acres in size. The profile of this soil has a thinner, lighter colored surface layer than the one described as typical for the series. In addition, the depth to bedrock is less. Included with this soil in the mapping are some areas of severely eroded Dekalb soils and a few areas of soils steeper than this soil. This soil is droughty and, where disturbed, is very severely susceptible to erosion. It is in trees, pasture, and hay. The limitations to use for onsite sewage disposal are severe. (Capability unit VIIe–1)

Dekalb very stony sandy loam, 0 to 12 percent slopes (DbB).—This soil is on knolls and the tops of hills and mountains. Areas range from 25 to 75 acres in size. The profile of this soil has a somewhat thicker and darker surface layer and is a few inches deeper to bedrock than the profile described as typical for the series. Included with this soil in mapping are a few small areas of Dekalb soil that is nonstony.

This very stony soil has too many stones to permit cultivation and use of row crops. It is suited to pasture, but most areas are wooded. The limitations to use for onsite sewage disposal are severe. (Capability unit VIs–1)

Dekalb very stony sandy loam, 12 to 30 percent slopes (DbD).—The profile of this soil is the one described as typical for the series. The soil is on the upper and middle parts of hillsides. Areas are mostly 25 to 75 acres in size. This soil has so many stones that it is not suited to row or other cultivated crops. It is well suited to pasture or trees. Most of it is in trees. The limitations to use for onsite sewage disposal are severe. (Capability unit VIs–1)

Dekalb very stony sandy loam, 30 to 80 percent slopes (DbF).—This soil is on upper and middle parts of the sides of mountains. Areas range from about 25 to 250 acres in size. The profile of this soil has a thinner subsoil and is shallower to bedrock than the one described as typical for the Dekalb series. Included with this soil in mapping are some small areas of rock outcrops and some areas that are extremely stony.

This soil has so many stones and is so steep that it cannot be cultivated. Nearly all of the soil is woodland, and it is well suited to that use. The limitations to use for onsite sewage disposal are severe. (Capability unit VIIs–2)

Elkins Series

The Elkins series consists of deep, very poorly drained, loamy soils on flood plains. These nearly level soils formed in sediments deposited by streams. They have a smooth or slightly concave surface that is covered with water in winter, spring, and some of the summer. These soils occur mostly in low areas along the Monongahela and Youghiogheny Rivers and along Jacobs Creek. Common trees are sycamore, willow, and alder. Other common plants are cattail, swampgrass, and ironweed.

A typical Elkins soil in pasture has a mottled, very dark gray silt loam surface layer about 9 inches thick. The subsoil extends to a depth of 20 inches and is dark-gray silty clay loam that is slightly firm and prominently mottled. The underlying material extends to a depth of 60 inches. It is gray silty clay loam or clay loam that is prominently mottled and is slightly firm to friable.

Elkins soils are flooded and have a water table at or near the surface most of the time. Locating outlets for tile lines or open ditches is difficult because the soils are only slightly above the stream level. Because of flooding and a high water table, these soils are poorly suited to cultivated crops. They provide suitable sites for dug-out ponds. The limitations for use as building sites are severe because of the flooding and wetness.

Representative profile of Elkins silt loam in a nearly level pasture 3 miles west of Markleysburg along Fike Run:

Ap—0 to 9 inches, very dark gray (5Y 3/1) silt loam; many, coarse, distinct, dark reddish-brown (5YR 4/3) mottles; moderate, fine, granular structure; friable, slightly sticky and slightly plastic; numerous fine and medium roots; strongly acid; gradual, smooth boundary.

Bg—9 to 20 inches, dark-gray (N 4/0) silty clay loam; common, coarse, prominent, dark reddish-brown (5YR 3/4) mottles; weak, coarse, subangular blocky structure; slightly firm, sticky and plastic; few fine and medium roots; strongly acid; clear, smooth boundary.

C1g—20 to 38 inches, gray (5Y 5/1) silty clay loam; common, coarse, prominent, strong-brown (7.5YR 5/8) mottles; massive; slightly firm, sticky and plastic; strongly acid; gradual, smooth boundary.

C2g—38 to 60 inches +, gray (5Y 5/1) clay loam; many, coarse, prominent, strong-brown (7.5YR 5/8) mottles; massive; friable, slightly sticky and slightly plastic; strongly acid.

Depth to bedrock ranges from 5 to 15 feet. The solum is 15 to 25 inches thick. Reaction is strongly acid throughout the profile. The Ap horizon is mainly very dark gray but ranges to very dark grayish brown. The Bg horizon is dark gray, gray, or olive in color and is silty clay loam, loam, or clay loam in texture. The C horizons are silty clay loam or clay loam.

Elkins soils occur in close association with Philo and Atkins soils and are more poorly drained than those soils.

Elkins silt loam (Ek).—This nearly level soil has a smooth, slightly concave surface. Included with this soil in mapping are areas where sand and silt were deposited on the surface by overflowing streams. Areas of this soil range from about 10 to 30 acres in size. (Capability unit IVw-2)

Ernest Series

The Ernest series consists of deep, moderately well drained, loamy soils. These nearly level to moderately steep soils formed in materials that accumulated at the base of the steeper slopes. Ernest soils occupy concave foot slopes and are widely distributed throughout the county. In some places these soils are very stony. Common trees are maple, oak, beech, hickory, ash, hemlock, elm, and dogwood. Ironweed, blackberry, milkweed, elderberry, goldenrod, and plantain are common plants in open, idle fields.

A typical cultivated Ernest soil has a dark-brown silt loam plow layer about 9 inches thick. The upper part of the subsoil, between depths of 9 and 23 inches, is strong-brown silty clay loam. It is firm and is distinctly mottled below a depth of 18 inches. The lower part of the subsoil extends to a depth of 40 inches and is silty clay loam that is strong brown, very firm, brittle, and compact. It is distinctly mottled with light gray. The underlying material is brown channery silty clay loam distinctly mottled with gray and yellowish red. It is firm and compact. This layer contains about 30 percent coarse fragments.

Ernest soils have moderately slow permeability and a moderate available moisture capacity. A water table rises to within 1½ to 3 feet of the surface when wetness is at its peak. Bedrock occurs at a depth of about 4 to 20 feet. Ernest soils are naturally strongly acid. They have a good capacity to store plant nutrients. In some places these soils are too stony for cultivation, but where the stones have been removed, the soils are suited to farming. Heaving of alfalfa is severe in winter. Very stony areas can be used for pasture. Ernest soils have a good potential for use as pond sites. The limitations to use for onsite sewage disposal are severe.

Representative profile of Ernest silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field 1½ miles northwest of Farmington:

Ap—0 to 9 inches, dark-brown (10YR 4/3) silt loam; weak, fine and medium, granular structure; friable, slightly sticky and slightly plastic; 12 percent coarse fragments up to 10 inches long; medium acid; abrupt, wavy boundary.

B21t—9 to 18 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, medium and fine, subangular blocky structure; firm, sticky and plastic; thick continuous clay films on ped faces; strongly acid; clear, smooth boundary.

B22t—18 to 23 inches, strong-brown (7.5YR 5/6) silty clay loam; few, fine, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium and coarse, subangular blocky structure; firm, sticky and plastic; thick continuous clay films on ped faces and along pores; strongly acid; abrupt, smooth boundary.

Bx—23 to 40 inches, strong-brown (7.5YR 5/6) silty clay loam; common, fine, distinct, light-gray (10YR 6/1) mottles; weak to moderate, medium, prismatic structure; very firm and brittle, sticky and slightly plastic; very thin, discontinuous clay films on ped faces; 15 percent coarse fragments up to 8 inches long; strongly acid; abrupt, smooth boundary.

C—40 to 48 inches +, brown (10YR 5/3) channery silty clay loam; common, medium, distinct, light-gray or gray (10YR 6/1) and yellowish-red (5YR 5/8) mottles; massive; firm, slightly sticky and slightly plastic; 30 percent coarse fragments up to 6 inches long; strongly acid.

Depth to bedrock ranges from 4 to 20 feet. The solum is 36 to 50 inches thick. A very firm fragipan begins 20 to 30 inches below the surface. In the very stony areas, stones and boulders are a foot to several feet in diameter. Depth to mottles of low chroma centers on 18 inches and ranges from 16 to 30 inches. The Ap horizon is dark brown or dark grayish brown. The B horizons are strong brown, yellowish brown, or brownish yellow. They are silty clay loam or silt loam. The C horizon is 15 to 30 percent coarse fragments of sandstone.

The Ernest soils occur in close association with the poorly drained Brinkerton soils. The Ernest soils are similar to

Cookport soils but have more silt and less sand in the B horizon. Also near the Ernest soils are the Wharton, Cavode, and Armagh soils. The Ernest soils have less clay in the B horizon than those soils and are better drained than the Cavode and Armagh soils.

Ernest silt loam, 0 to 3 percent slopes (ErA).—This soil is at the base of the steeper slopes. The areas are about 4 to 12 acres in size. The profile of this soil has a thicker, darker colored surface layer than the profile described as representative for the series. Included with this soil in mapping are some areas of deep, well-drained soils.

This soil is suited to intensive use for crops. It is mostly cropland or in pasture. The main limitation for farming is wetness. (Capability unit IIw–2)

Ernest silt loam, 3 to 8 percent slopes, moderately eroded (ErB2).—The profile of this soil is the one described as typical for the series. The soil is at the base of the steeper slopes. The areas range from about 8 to 20 acres in size. Included with this soil in the mapping are a few areas of severely eroded Ernest soils and some areas of deep, well-drained soils.

This soil is suited to intensive use for crops. The main limitation to this use is erosion. Most of this soil is cropland or in pasture. (Capability unit IIe–2)

Ernest silt loam, 8 to 15 percent slopes, moderately eroded (ErC2).—This soil is on the foot slopes of hills. The areas range from about 10 to 30 acres in size. The profile of this soil has a slightly thinner surface layer than the profile described as typical for the series. Included with this soil in mapping are areas of severely eroded Ernest soils and some areas of soils that have slopes of more than 15 percent. Also included are areas of deep, well-drained soils.

This soil is well suited as cropland if it is managed well. The main limitation is erosion. Most areas are cropped. (Capability unit IIIe–3)

Ernest very stony silt loam, 0 to 8 percent slopes (EsB).—This soil is on the foot slopes of hills. Many stones are scattered on the surface. The areas are about 20 to 50 acres in size. The profile of this soil has a thin mat of organic matter and a thin, dark surface layer and lacks the plow layer of the profile described as typical for the series. Included with this soil in mapping are a few poorly drained, very stony soils.

This soil is suited to permanent pasture. Most areas are wooded. (Capability unit VIs–2)

Ernest very stony silt loam, 8 to 25 percent slopes (EsD).—This slightly eroded soil occupies the foot slopes of hills and mountains. Many stones are scattered on the surface. The areas range from about 25 to 50 acres in size. Unlike the profile described as representative of the Ernest series, the profile of this soil is very stony and the surface is covered with a thin, dark-colored leaf litter and humus mat.

This soil is suited to permanent pasture. Most of it is wooded. (Capability unit VIs–2)

Gilpin Series

The Gilpin series consists of moderately deep, well-drained, loamy soils of the uplands. These nearly level to very steep soils formed in materials weathered from bedrock of sandstone, siltstone, and shale. In some places these soils are very stony. All Gilpin soils contain many shale and sandstone fragments. Gilpin soils occupy the convex areas of hilltops and rolling slopes of hills. They are mostly in the eastern part of Fayette County. Common trees are red oak, black oak, sassafras, dogwood, soft maple, and some chokecherry.

A typical cultivated Gilpin soil has a dark grayish-brown channery silt loam plow layer about 7 inches thick. The upper part of the subsoil extends to a depth of 20 inches and is yellowish-brown and light yellowish-brown silty clay loam that has some sandstone fragments. It is slightly firm or firm. The lower part of the subsoil extends to a depth of 31 inches and is friable, yellowish-brown loam that has many small sandstone fragments. It is underlain by bedrock of hard, thin-bedded, fine-grained sandstone.

Gilpin soils are moderately permeable and have rapid internal drainage. The water table is below 3 feet from the surface, and bedrock lies within 2 to 3½ feet of the surface. Gilpin soils have a low available moisture capacity. They are strongly acid or very strongly acid and have moderate natural fertility. Their capacity to hold and to release plant nutrients is good. The very stony areas have stones or boulders a foot to several feet in diameter. Where stones have been removed, these soils are easily worked and early tillage is possible.

Gilpin soils are suited to alfalfa and other farm crops. They have a limited potential for use as sites for farm ponds. The limitations to use for onsite sewage disposal are severe.

Representative profile of Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded, in an idle field 1 mile south of White in Saltlick Township:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) channery silt loam; moderate, fine and medium, granular structure; friable, slightly sticky and slightly plastic; 20 percent sandstone fragments; strongly acid; abrupt, smooth boundary.

B21t—7 to 14 inches, yellowish-brown (10YR 5/4) light silty clay loam; moderate, medium and fine, subangular blocky structure; slightly firm, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 12 percent coarse sandstone fragments; very srongly acid; clear, wavy boundary.

B22t—14 to 20 inches, light yellowish-brown (10YR 6/4) channery silty clay loam; weak, medium, subangular blocky structure; firm, slightly sticky and slightly plastic; thin continuous clay films on ped faces; 25 percent sandstone fragments; strongly acid; clear, wavy boundary.

B23—20 to 25 inches, yellowish-brown (10YR 5/4) channery loam; weak, fine and medium, subangular blocky structure; friable, slightly sticky and nonplastic; very thin discontinuous clay films on ped faces; 35 percent coarse fragments; very strongly acid; clear, wavy boundary.

B3—25 to 31 inches, yellowish-brown (10YR 5/4) very channery loam; weak, medium, subangular blocky structure; friable, nonsticky and nonplastic; 40 percent coarse fragments; very strongly acid; abrupt, smooth boundary.

R—31 inches +, hard, thin-bedded, fine-grained sandstone.

Depth to bedrock ranges from 2 to 3½ feet. The bedrock consists of thin-bedded sandstone, siltstone, and shale. The solum is 20 to 32 inches thick. Stones or boulders, a foot to several feet in diameter, are on the surface in the very stony areas. In wooded areas thin O1 and O2 horizons overlie the A horizon. The B horizons normally are channery or very channery silty clay loam, loam, or silt loam. The content of coarse fragment ranges from 10 to 40 percent. In some areas a C horizon of yellowish brown or light olive brown occurs and is mostly very channery loam or very channery silt loam.

Gilpin soils occur in close association with Wharton, Cavode, and Armagh soils. In some areas where Gilpin soils are steep, they occur in an intricate pattern with Weikert soils. Gilpin soils are deeper to bedrock than Weikert soils. Also near the Gilpin soils are the Dekalb and Clymer soils. Gilpin soils are better drained, have less clay in the B horizon, and are shallower to bedrock than the Wharton, Cavode, and Armagh soils. The B horizon of Gilpin soils has more silt and less sand than the B horizon of the Dekalb or Clymer soils.

Gilpin channery silt loam, 0 to 3 percent slopes (GcA).—This soil occupies broad tops of hills and mountains. Most areas of this nearly level soil are 4 to 12 acres in size. The surface layer of this soil is thicker and darker than that in the profile described as representative of the series. Included with this soil in mapping are a few areas of Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded.

Gilpin channery silt loam, 0 to 3 percent slopes, is well suited as cropland, though it may become droughty during periods of low rainfall. Most areas are woodland or cropland. (Capability unit IIs–1)

Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded (GcB2).—This soil occupies broad tops of hills and mountains. The areas mapped are about 6 to 30 acres in size. The subsoil of this soil is thicker than that in the profile described as typical for the series, and bedrock is a few inches farther from the surface. Included with this soil in mapping are a few small areas of severely eroded Gilpin soils, some areas of deeper soils, and a few areas of reddish-colored soils.

This soil is suited as cropland. It may become droughty during periods of low rainfall. (Capability unit IIe–3)

Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded (GcC2).—This soil occupies the upper slopes of hills and mountains. It has the profile described as typical for the series. The areas are about 6 to 30 acres in size. Included with this soil in mapping are a few areas of severely eroded Gilpin soils, some areas of soils that are deeper to bedrock than this soil, and a few areas of reddish-colored soils.

This soil is suited as cropland, but during periods of low rainfall, it is droughty. Surface runoff is medium, and the erosion hazard is moderate. Most areas are woodland or cropland. (Capability unit IIIe–4)

Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded (GcD2).—This soil occupies the upper slopes of hills and mountains. The areas are about 10 to 40 acres in size. This soil has a thinner, lighter colored surface layer and a thinner subsoil than has the profile described as typical for the series. Also, it is slightly more shallow to bedrock. Included in mapping are a few areas of severely eroded Gilpin soils, some areas of soils deeper to bedrock than this soil, and a few areas of reddish-colored soils.

This soil is suited to hay and to limited use for crops. It becomes droughty during periods of low rainfall. Surface runoff is rapid, and the erosion hazard is moderate to severe. Most of this soil is woodland or cropland. (Capability unit IVe–4)

Gilpin very stony silt loam, 0 to 12 percent slopes (GnB).—This slightly eroded soil occupies broad tops of hills and mountains. The areas range from about 20 to 50 acres in size. The profile of this soil has a thin organic layer of leaf litter and raw humus covering the surface, but the profile described as typical for the series does not. Stones and boulders on the surface are a foot to several feet in diameter. Included with this soil in mapping are some areas of very stony soils that are more than 40 inches to bedrock. Also included are a few short, steep escarpments consisting of rock and soil.

This soil is suited to permanent pasture. It is too stony for cultivation and is wooded. (Capability unit VIs–1)

Gilpin very stony silt loam, 12 to 30 percent slopes (GnD).—This slightly eroded soil occupies the side slopes of hills and mountains. Most areas are about 25 to 75 acres in size. The profile of this soil has a thin organic covering of leaf litter and raw humus on the surface, but the profile described as typical for the series does not. On the surface are stones and boulders a foot to several feet in diameter. Included with this soil in mapping are areas of very stony soils that are more than 40 inches to bedrock. Also included are a few areas of rock and soil on short, steep escarpments.

This soil is suited to permanent pasture. It is too stony for cultivation. Most of the areas are woodland. (Capability unit VIs–1)

Gilpin very stony silt loam, 30 to 60 percent slopes (GnF).—This soil occupies the side slopes of mountains and hills. The areas range from about 25 to 250 acres in size. The profile of this soil has a thin covering of leaf litter and humus on the surface, but the profile described as typical for the series does not. Also, bedrock is nearer the surface in this soil. Stones and boulders on the surface are a foot to several feet in diameter. Included with this soil in mapping are areas of very stony soils that are more than 40 inches to bedrock. Also included are areas of rock and soil on escarpments.

This soil is well suited to trees. It is too steep and too stony for cultivation. It is in trees. (Capability unit VIIs–2)

Gilpin-Weikert channery silt loams, 30 to 60 percent slopes (GrF).—This mapping unit is a complex of Gilpin and Weikert soils that occur in such an intricate pattern that they cannot be shown separately at the map scale used. Gilpin soils make up about 65 percent of the unit, and Weikert soils about 35 percent.

These soils occupy hillsides. The size of areas is about 15 to 100 acres. The profile of the Gilpin soil is shallower to bedrock than the profile described as representative of the series. It also has a thinner, lighter colored surface layer. The Weikert part of this mapping unit has the profile described as representative of the Weikert series.

Included with these soils in mapping are some areas of severely eroded Gilpin and Weikert soils, a few areas of medium acid to slightly acid soils, and some areas of soils that are more shaly than typical. In addition, some areas contain soils that have reddish colors and soils that are deeper to bedrock and less acid than these soils.

Partly because surface runoff is very rapid, these soils are droughty. They are well suited to trees. The present uses are woodland and pasture, but the soils in some areas are idle. (Capability unit VIIe–1)

Guernsey Series

The Guernsey series consists of deep, moderately well drained, loamy soils of the uplands. These nearly level to steep soils formed in materials weathered from bedrock of gray and brown shale, sandstone, and limestone. The Guernsey soils are in the western part of Fayette County near the coal fields. They occupy upland benches, drainage

divides, rounded hilltops, and hillsides. The surface is rolling and generally slightly concave. Common trees are black locust, chokecherry, yellow-poplar, red oak, black oak, ash, crab apple, and walnut. Other common plants are goldenrod, ragweed, thistle, milkweed, sumac, and ironweed.

A typical cultivated Guernsey soil has a dark-brown silt loam plow layer about 9 inches thick. The upper part of the subsoil, between depths of 9 and 37 inches, is yellowish-brown and brown silty clay loam and channery silty clay loam. It is mottled with gray and yellowish brown below a depth of 15 inches. The lower part of the subsoil extends to a depth of 60 inches and is light brownish-gray silty clay and brown silty clay loam that are mottled. The subsoil is firm or very firm when moist and sticky or very sticky and plastic or very plastic when wet. The underlying material extends to a depth of about 72 inches and is gray shaly silty clay. It is distinctly mottled with brown and is about 45 percent shale fragments. Gray, thin-bedded shale underlies this soil at a depth of about 72 inches.

Guernsey soils have slow permeability and a moderate available moisture capacity. Natural fertility is moderate to high. The water table rises to within 1½ feet of the surface during wet periods. The Guernsey soils are not easily leached, and they have a high capacity for storing plant nutrients. These soils erode easily, and the eroded areas are cloddy, hard, and difficult to till. Heaving of alfalfa is severe in winter. These soils are suited to most cultivated crops. They generally have limitations as sites for farm ponds. The limitations to use for onsite sewage disposal are severe.

Representative profile of Guernsey silt loam, 8 to 15 percent slopes, moderately eroded, in an idle field 1 mile northeast of New Geneva:

Ap—0 to 9 inches, dark-brown (10YR 4/3) silt loam; moderate, medium, granular structure; friable, slightly sticky and slightly plastic; 12 percent coarse fragments; medium acid; abrupt, smooth boundary.

B21t—9 to 15 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin continuous clay films on ped faces; 8 percent sandstone fragments; strongly acid; clear, wavy boundary.

B22tg—15 to 22 inches, brown (10YR 5/3) silty clay loam; common, fine, faint, gray (10YR 6/1) mottles and common, medium, faint, dark yellowish-brown (10YR 4/4) mottles; moderate, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm, sticky and plastic; thick, continuous, grayish-brown (10YR 5/2) clay films on ped faces; 12 percent coarse fragments; very strongly acid; clear, wavy boundary.

B23tg—22 to 37 inches, brown (10YR 5/3) channery silty clay loam; many, coarse, distinct, gray (10YR 6/1) mottles and common, medium, distinct, yellowish-brown (10YR 5/6) mottles; strong, coarse, prismatic structure parting to strong, coarse, subangular blocky; very firm, very sticky and plastic; thick, continuous, light brownish-gray (10YR 6/2) clay films; 20 percent coarse fragments; very strongly acid; clear, wavy boundary.

B24tg—37 to 49 inches, light brownish-gray (10YR 6/2) silty clay; many, medium, faint, brown (10YR 5/3, 7.5YR 4/4) mottles; strong, coarse, prismatic structure parting to strong, coarse, subangular blocky; very firm, very sticky and very plastic; thick, continuous, gray (10YR 6/1) clay films; 5 percent sandstone fragments; very strongly acid; abrupt, wavy boundary.

B3g—49 to 60 inches, brown (10YR 5/3); silty clay loam; many, coarse, distinct, gray (10YR 6/1) mottles and common, medium, distinct, brown (7.5YR 4/4) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin continuous clay films on ped faces; 10 percent shale; strongly acid; abrupt, wavy boundary.

C—60 to 72 inches, gray (10YR 6/1) shaly silty clay; many, fine, distinct, brown (10YR 5/3) mottles; sticky and plastic; 45 percent weathered gray clay shale; strongly acid; abrupt, smooth boundary.

R—72 inches +, gray shale; firm in place; a few silty clay loam coatings on fragments and in cracks.

Depth to bedrock ranges from 3½ to 7 feet. The solum is about 42 to 70 inches thick. The mottles of low chroma begin in the upper 10 inches of the Bt horizon and increase in distinctness and in abundance with depth. The Ap horizon is dark brown, grayish brown, or dark grayish brown in color and is silt loam or silty clay loam in texture. The upper B horizons are brown, yellowish brown, or strong brown and are silty clay loam or silt loam. The lower B horizons are light brownish gray, grayish brown, or brown. They are silty clay loam, silty clay, or clay. Some shale occurs, but coarse fragments normally are fairly few. The C horizon is gray, light brownish gray, or grayish brown. It is silty clay, clay, or silty clay loam. Coarse fragments of shale make up 40 to 50 percent of the C horizon. The bedrock consists of thin-bedded shale, limestone, shaly sandstone, and sandstone.

The Guernsey soils occur in close association with Westmoreland, Brooke, Library, and Clarksburg soils. Guernsey soils are more poorly drained and have more clay in the B horizon than Westmoreland soils, are more poorly drained and deeper to bedrock than Brooke soils, and are better drained than Library soils. Guernsey soils have more clay in the B horizon than Clarksburg soils and lack the fragipan that occurs in those soils.

In some places the Guernsey soils were mapped as part of the Clarksburg-Guernsey complexes. Clarksburg soils are described under the heading "Clarksburg Series."

Guernsey silt loam, 3 to 8 percent slopes, moderately eroded (GsB2).—This soil is on broad hilltops, upland benches, and divides. The areas range from about 8 to 25 acres in size. The profile of this soil is similar to that described as typical for the series except that the surface layer is a few inches thicker. Included with this soil in mapping are a few areas of severely eroded Guernsey soils and some areas of soils that have slopes of less than 3 percent. Surface runoff is medium, and the erosion hazard is moderate.

This soil is one of the better soils for farming in the county. It is suited to intensive farming, and most areas are cultivated. (Capability unit IIe-2)

Guernsey silt loam, 8 to 15 percent slopes, moderately eroded (GsC2).—This soil occupies rolling lower slopes, hilltops, and upland benches. It has the profile described as typical for the Guernsey series. The areas range from about 10 to 40 acres in size. Included with this soil in mapping are a few small areas of Guernsey silty clay loam, 8 to 15 percent slopes, severely eroded, and a few areas of poorly drained soils.

Surface runoff is rapid, and the erosion hazard is moderate to severe.

This soil is suited to corn, small grain, soybeans, and hay. Most of it is cultivated. (Capability unit IIIe-3)

Guernsey silt loam, 15 to 25 percent slopes, moderately eroded (GsD2).—This soil occupies hillsides. Most areas are about 10 to 30 acres in size. The profile of this soil is similar to the one described as typical for the series except that it has a thinner surface layer and subsoil. Included with this soil in mapping are a few small areas of Guernsey silty clay loam, 15 to 25 percent slopes, severely eroded.

This soil is suited to hay and to limited use for row crops or small grain. In unprotected areas much water from rain-

fall is lost in runoff. In cultivated areas the erosion hazard is moderate to severe. Most of the soil is cultivated or idle. (Capability unit IVe–2)

Guernsey silt loam, 25 to 35 percent slopes, moderately eroded (GsE2).—This soil occupies hillsides. Most areas are about 10 to 25 acres in size. The profile of this soil has a thinner, lighter colored surface layer than has the profile described as typical for the series. Included in mapping are some areas of severely eroded Guernsey soils, a few small areas of soils on landslips, and some small areas of soils having slopes of more than 35 percent. Also included are areas of moderately deep, well-drained soils that have a silty clay loam surface layer and were derived mostly from weathered limestone. (Capability unit VIe–1)

Guernsey silty clay loam, 8 to 15 percent slopes, severely eroded (GtC3).—This soil occupies rolling lower slopes, hilltops, and upland benches. Most areas range from about 10 to 40 acres in size. The areas are irregular in shape. The profile of this soil has a silty clay loam surface layer, but the profile described as representative of the series does not.

Included in mapping are some small landslips and a few areas of poorly drained soils that have a silty clay loam surface layer.

This soil is suited to hay and to limited use for row crops and small grain. Most of this soil is cultivated. In unprotected areas much water from rainfall is lost in runoff. In cultivated areas the erosion hazard is severe. (Capability unit IVe–2)

Guernsey silty clay loam, 15 to 25 percent slopes, severely eroded (GtD3).—This soil occupies rolling hillsides around old coking plants. Most areas range from about 10 to 40 acres in size. The profile of this soil has a silty clay loam surface layer, but the typical profile does not. Included in mapping are small areas of soils on landslips. In unprotected areas much water from rainfall is lost in runoff. In cultivated areas the erosion hazard is severe. This soil is suited to pasture, though most areas are idle. (Capability unit VIe–1)

Hazleton Series

The Hazleton series consists of deep, well-drained, loamy soils of the uplands. These soils developed in materials weathered in place from sandstone and shale bedrock. These nearly level to moderately steep soils occur on the top and the upper and middle side slopes of hills and mountains. Most areas of the Hazleton soils are in the eastern part of the county. A few are associated with the Westmoreland soils in the western part. Common trees are red oak, scarlet oak, maple, ash, aspen, black birch, dogwood, sassafras, and some yellow-poplar. The Hazleton soils in the western part of Fayette County also support black locust and chokecherry. Mountain-laurel, greenbrier, groundpine, teaberry, and moss are in the understory.

A typical cultivated Hazleton soil has a grayish-brown channery loam plow layer about 7 inches thick. This layer is underlain by a yellowish-brown channery sandy loam subsurface layer that extends to a depth of 11 inches. The subsoil extends to a depth of 31 inches and is strong-brown, friable channery loam and channery sandy loam. The underlying material, between depths of 31 and 59 inches, is brownish-yellow, strong-brown, and light yellowish-brown channery and very channery sandy loam. This layer is underlain by thin-bedded sandstone bedrock.

Hazleton soils have moderately rapid permeability and rapid internal drainage. Natural fertility and available moisture capacity are moderate to low. The water table is less than 3 feet below the surface. Bedrock normally is between 3½ and 5 feet below the surface. These soils generally are medium acid to very strongly acid in the lower part of the subsoil. Hazleton soils are suited to farming and are cultivated or wooded. During periods of low rainfall, these soils are droughty. They are poorly suited as sites for ponds.

Representative profile of Hazleton channery loam, 12 to 20 percent slopes, moderately eroded, in a hayfield 5½ miles northeast of Ohiopyle; profile S64–Pa–26–8(1–9) in tables 10 and 11 in the section "Laboratory Data":

Ap—0 to 7 inches, grayish-brown (10YR 5/2) channery loam; weak, fine, granular structure; friable, slightly sticky and nonplastic; 20 percent sandstone fragments up to 4 inches long; medium acid; abrupt, smooth boundary.

A2—7 to 11 inches, yellowish-brown (10YR 5/6) channery sandy loam; weak, fine, granular structure; friable, nonsticky and nonplastic; 15 percent sandstone fragments up to 3 inches long; medium acid; clear, wavy boundary.

B1—11 to 18 inches, strong-brown (7.5YR 5/8) channery loam; weak, medium, subangular blocky structure; friable, nonsticky and nonplastic; 20 percent sandstone fragments up to 3 inches long; very strongly acid; clear, wavy boundary.

B21—18 to 25 inches, strong-brown (7.5YR 5/6) channery sandy loam; weak, medium, subangular blocky structure; friable, nonsticky and nonplastic; very thin continuous clay films in pores; 20 percent sandstone fragments up to 3 inches long; very strongly acid; clear, wavy boundary.

B22—25 to 31 inches, strong-brown (7.5YR 5/6) channery sandy loam; weak, medium, subangular blocky structure; friable, nonsticky and nonplastic; clay bridging of sand grains; 20 percent sandstone fragments up to 3 inches long; very strongly acid; clear, wavy boundary.

C1—31 to 39 inches, brownish-yellow (10YR 6/6) very channery loamy sand, brown (7.5YR 5/4) at contact with lower horizon; massive; friable, nonsticky and nonplastic; few patchy clay films in pores; 50 percent sandstone fragments up to 3 inches long; very strongly acid; clear, wavy boundary.

C2—39 to 50 inches, strong-brown (7.5YR 5/6) channery sandy loam; weak, medium, platy structure; firm, nonsticky and nonplastic; clay bridging on sand grains; 20 percent sandstone fragments up to 3 inches long; few thin coatings of manganese on surface of peds and stones; very strongly acid; clear, wavy boundary.

C3—50 to 59 inches, light yellowish-brown (10YR 6/4) very channery sandy loam; weak, fine and medium, subangular blocky structure; firm, nonsticky and nonplastic; some silt and clay films on upper surface of sandstone fragments; 60 percent sandstone fragments up to 8 inches long; strongly acid; abrupt, wavy boundary.

R—59 inches +, thin, horizontally bedded sandstone; some soil material on the upper surface of and in the sandstone.

Depth to bedrock ranges from 3½ to 5 feet. The bedrock is thin-bedded or massive sandstone, shale, and conglomerate. The solum is 20 to 40 inches thick. The B horizons are yellowish brown or strong brown. They are channery loam or channery sandy loam. The C horizons are strong brown, light yellowish brown, or yellowish brown. Texture is channery or very channery sandy loam.

Hazleton soils occur in close association with Clymer, Dekalb, and Cookport soils. Hazleton soils lack the Bt horizon of the Clymer soils. They are deeper than Dekalb soils and

better drained than Cookport soils. In some areas Hazleton soils occur with Gilpin and Westmoreland soils and have more sand and less silt in the B horizon than those soils.

Hazleton channery loam, 0 to 3 percent slopes (HaA).—This soil occupies broad tops of hills and mountains and upland benches. The areas mapped are mostly 4 to 12 acres in size. This soil is nearly level and is slightly susceptible to erosion. The profile of this soil is similar to that described as typical for the series except that it has a thicker surface layer. Included with this soil in mapping are a few areas of Hazleton channery loam, 3 to 12 percent slopes, moderately eroded, and of Cookport loam, 0 to 3 percent slopes.

This soil can be cropped intensively. It is now in trees or is farmland. The limitations to use for onsite sewage disposal are moderate. (Capability unit I–1)

Hazleton channery loam, 3 to 12 percent slopes, moderately eroded (HaB2).—This soil is on the broad tops of hills and mountains and on upland benches. The areas range from about 8 to 25 acres in size. The profile of this soil is similar to the one described as typical for the series except that the surface layer is slightly thicker. Included with this soil in mapping are some wooded areas of Hazleton soils that are slightly eroded. This soil is suited to crops. The erosion hazard is moderate to slight. The limitations to use for onsite sewage disposal are moderate. (Capability unit IIe–1)

Hazleton channery loam, 12 to 20 percent slopes, moderately eroded (HaC2).—This soil occupies the rolling tops of hills and the upper and middle parts of hillsides. The areas range from about 8 to 25 acres in size. The profile of this soil is the one described as typical for the series. Included with this soil in mapping are a few areas of soils that have bedrock within 40 inches of the surface.

This soil is suited to moderately intensive cropping. Erosion is a moderate hazard. The soil is wooded or is farmland. The limitations to use for onsite sewage disposal are moderate. (Capability unit IIIe–1)

Hazleton channery loam, 20 to 30 percent slopes, moderately eroded (HaD2).—This soil occupies the sides of hills and mountains. The areas are mostly 10 to 30 acres in size. The profile of this soil has a thinner, lighter colored surface layer and a thinner subsoil than the profile described as typical for the series. Also, it is shallower to bedrock. Included with this soil in mapping are some areas of soils that have bedrock within 40 inches of the surface.

This soil is suited to hayland and to limited use as cropland. Most of it is woodland, partly because the erosion hazard is moderate to severe. A small acreage is farmland. The limitation to use for onsite sewage disposal is severe. (Capability unit IVe–1)

Library Series

The Library series consists of deep, somewhat poorly drained, loamy soils that have a clayey subsoil. These soils of the uplands formed in materials weathered from gray clay shale, limestone, and some shaly sandstone. They are nearly level and gently sloping and occur in the western part of the county near the coal fields. Library soils have slightly concave or flat surfaces, and they occupy drainage divides, benches, and the lower hilltops. Common trees are black locust, black walnut, chokecherry, crab apple, red oak, white oak, laurel oak, hickory, and yellow-poplar. Other common plants are goldenrod, ragweed, thistle, plantain, elderberry, and ironweed.

A typical profile of a Library soil has a dark-gray silty clay loam surface layer about 9 inches thick. The upper part of the subsoil extends to a depth of 16 inches and is a mottled, brown, firm clay. The lower part of the subsoil extends to a depth of 39 inches and is mottled, light-gray and grayish-brown, very firm and firm silty clay. The underlying material extends to a depth of 44 inches and is mottled grayish-brown shaly silty clay loam that contains about 45 percent shale fragments. It is underlain by thin-bedded gray clay shale.

Library soils are slowly permeable and have a water table that rises to within 6 inches of the surface when wetness is at its peak. The available moisture capacity is moderate to low, and the natural fertility is moderate to high. The capacity to store plant nutrients is high, and leaching is slight. Library soils erode very readily, and the eroded areas are puddled, cloddy, hard, and difficult to till. When these soils dry out, they crack. The cracks are ½ to 1 inch wide and about 3 feet deep. Heaving is severe in winter.

These soils are well suited to hay. Hay plants tolerant of wet soils grow best. Library soils have limited potential for use as sites for ponds because bedrock is too near the surface and sites are in unfavorable locations. These soils have severe limitations to use for onsite sewage disposal because the subsoil is slowly permeable.

Representative profile of Library silty clay loam, 2 to 8 percent slopes, moderately eroded, in a hayfield 1 mile north of Smithfield:

Ap—0 to 9 inches, dark-gray (10YR 4/1) silty clay loam; moderate, coarse, granular structure; friable to firm, sticky and plastic; neutral; abrupt, smooth boundary.

B21t—9 to 16 inches, brown (10YR 5/3) clay; many, coarse, prominent, light-gray (10YR 7/1) mottles; strong, coarse, prismatic structure parting to moderate, coarse, angular blocky; firm, very sticky and very plastic; thick continuous clay films on faces of prisms and peds; neutral; clear, wavy boundary.

B22tg—16 to 26 inches, light-gray (10YR 6/1) silty clay; many, coarse, prominent, yellowish-red (5YR 5/6) and light brownish-gray (10YR 6/2) mottles; strong, coarse, prismatic structure parting to moderate, coarse, angular blocky; very firm, very sticky and very plastic; continuous very thick clay films on faces of prisms and peds; few, fine, black concretions; neutral; clear, wavy boundary.

B3tg—26 to 39 inches, silty clay that has grayish-brown (2.5Y 5/2) ped exteriors, light brownish-gray (2.5Y 6/2) ped interiors; common, coarse, prominent, yellowish-red (5YR 4/6) and brown or dark-brown (7.5YR 4/2) mottles; strong, coarse, prismatic structure parting to strong, coarse, angular blocky; firm, very sticky and very plastic; continuous thick clay films on ped faces; neutral; abrupt, smooth boundary.

C—39 to 44 inches, grayish-brown (2.5Y 5/2) shaly silty clay loam; many, coarse, prominent, yellowish-red (5YR 4/6) and brown (7.5YR 4/2) mottles; massive; very sticky and very plastic; 45 percent shale fragments; neutral; abrupt, smooth boundary.

R—44 inches +, weak, thin-bedded, gray clay shale that breaks into pieces ¼ inch by 4 inches by 7 inches in size.

The depth to bedrock ranges from 3½ feet to 6 feet. The solum ranges from 25 to 40 inches in thickness. Mottles of low chroma are immediately below the Ap horizon. The Ap horizon is dark gray or dark grayish brown, and when wet, it is sticky and plastic. The B horizons are gray, grayish brown, light brownish gray, or brown and are mottled with light gray, light

brownish gray, brown, reddish brown, yellowish red, and strong brown. The B horizons are silty clay, silty clay loam, or clay. In places the C horizon is gray silty clay.

The somewhat poorly drained Library soils are in close association with the moderately deep, well drained Brooke soils; the deep, well drained Westmoreland soils, and the moderately well drained Guernsey soils. The Library soils are also near the Thorndale soils and have more clay in the B horizon than those soils, which have a fragipan.

Library silty clay loam, 2 to 8 percent slopes, moderately eroded (LbB2).—This soil is in areas about 4 to 12 acres in size. Included with this soil in mapping are areas of Guernsey silt loam, 3 to 8 percent slopes, moderately eroded, and a few areas of soils that have slope of less than 2 percent. Most of this soil is cultivated. (Capability unit IIIw-2)

Lindside Series

The Lindside series consists of deep, moderately well drained, loamy soils that formed in sediments that were deposited by streams on flood plains in the western part of the county. These soils are nearly level and have a slightly concave surface. Common trees are sycamore, alder, willow, hickory, walnut, beech, and chokecherry. Other common plants are ironweed, swampgrass, milkweed, thistle, and plantain.

A profile of a typical Lindside soil has a dark-brown silt loam surface layer about 8 inches thick. The upper part of the subsoil extends to a depth of about 35 inches and is brown and dark yellowish-brown, friable silt loam. The lower part of the subsoil extends to a depth of 47 inches and is mottled, grayish-brown, very friable sandy loam. It is underlain by stratified clay, silt, sand, and gravel.

A water table rises to within 1½ to 3 feet of the surface when wetness is at its peak. Lindside soils are about 5 to 15 feet to bedrock. The permeability is moderate, the surface runoff is slow, and the erosion hazard is none to slight. The available moisture capacity is high. These soils normally are medium acid to neutral.

Lindside soils are suited to crops, but most areas are in pasture or are idle. These soils are susceptible to flooding, but flooding is not likely during the growing season. These soils have limited potential as sites for ponds because the substratum is permeable. Limitations for onsite sewage disposal are severe because of flooding.

Representative profile of Lindside silt loam in a nearly level cultivated field 1¼ miles northwest of Uniontown along the streambank of Jennings Run:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; moderate, fine, granular structure and very weak, thin, platy structure; friable, slightly sticky and slightly plastic; medium acid; clear, wavy boundary.

B1—8 to 14 inches, brown (10YR 4/3) silt loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; medium acid; clear, wavy boundary.

B21—14 to 22 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, medium, prismatic structure parting to weak, medium, subangular blocky; friable, slightly sticky and slightly plastic; slightly acid; clear, wavy boundary.

B22—22 to 26 inches, brown (10YR 4/3) silt loam; common, fine, distinct, dark reddish-brown (5YR 3/4) mottles and many, coarse, faint, gray (10YR 5/1) mottles; weak, medium, prismatic structure parting to weak, medium, subangular blocky; friable, slightly sticky and slightly plastic; pockets of organic matter; slightly acid; abrupt, wavy boundary.

B23—26 to 35 inches, brown (10YR 5/3) silt loam; few, fine, faint, yellowish-brown (10YR 5/6) mottles and common, medium, distinct, gray (10YR 5/1) mottles; very weak, coarse, prismatic structure parting to very weak, fine, subangular blocky; friable, slightly sticky and nonplastic; neutral; clear, wavy boundary.

B3g—35 to 47 inches, grayish-brown (2.5Y 5/2) sandy loam; many, medium, prominent, yellowish-red (5YR 4/6) mottles; very weak, coarse, subangular blocky structure; very friable, slightly sticky and nonplastic; neutral; abrupt, smooth boundary.

C—47 to 60 inches +, stratified clay, silt, sand, and gravel.

The depth to bedrock ranges from 5 to 15 feet. The reaction throughout the profile ranges from neutral to medium acid. Mottles of low chroma are within 24 inches of the surface. The upper B horizons range from dark brown to yellowish brown. The B23 and B3g horizons range from gray to grayish brown or dark brown. The B23 horizon is silt loam or silty clay loam.

The moderately well drained Lindside soils occur in close association on the flood plains with the somewhat poorly drained Newark soils and the poorly drained Melvin soils. The Lindside soils are near the Chavies and Monongahela on terraces. The Lindside soils are more poorly drained and contain more silt in the subsoil than the Chavies soils and lack the fragipan of the Monongahela soils.

Lindside silt loam (Ln).—This nearly level soil occurs in areas about 8 to 20 acres in size. It extends along the flood plains of the larger streams or drainageways. Included with this soil in mapping are small areas of deep, well-drained soils on flood plains, and small areas of soils that are gently sloping. (Capability unit IIw-1)

Melvin Series

The Melvin series consists of deep, poorly drained, loamy soils that formed in sediments deposited by streams. These nearly level soils have a uniform or slightly concave surface and occur in the western part of the county. Melvin soils are on flood plains and are flooded in spring and early in summer. Common trees are sycamore, alder, willow, hickory, walnut, beech, and chokecherry. Other common plants are ironweed, swampgrass, milkweed, thistle, plantain, and cattail.

A typical profile of a Melvin soil has a mottled dark grayish-brown silt loam surface layer about 9 inches thick. The subsoil extends to a depth of 39 inches and is dark grayish-brown to dark-gray, friable silty clay loam that is mottled. The underlying material is very dark grayish-brown and grayish-brown, friable loam over stratified, intermixed gravel, sand, silt, and clay.

A water table is within 0 to ½ foot of the surface when wetness is at its peak. Melvin soils have moderately slow permeability. Surface runoff is slow, and the erosion hazard is slight. The available moisture capacity is high. These soils are medium acid to neutral.

Use of Melvin soils as cropland is limited because of flooding and wetness. These soils are mostly in pasture or are idle. They have limited potential for use as pond sites because of flooding and the sand lenses in the underlying material. Limitation to use for onsite sewage disposal is severe because of flooding and the high water table.

Representative profile of Melvin silt loam in an area of Melvin and Newark silt loams in a nearly level idle field one-fourth mile east of New Salem:

Ap—0 to 9 inches, dark grayish-brown (2.5Y 4/2) silt loam; common, fine, prominent, yellowish-red (5YR 5/6) mottles; weak, fine and medium, granular structure; very friable; neutral; clear, wavy boundary.

B1g—9 to 15 inches, dark grayish-brown (2.5Y 4/2) light silty clay loam; common, medium, prominent, yellowish-red (5YR 4/8) mottles; weak, fine, subangular blocky structure; friable, slightly plastic and slightly sticky; medium acid; clear, wavy boundary.

B21g—15 to 24 inches, grayish-brown (2.5Y 5/2) silty clay loam; many, fine and medium, prominent, dark-brown (7.5YR 4/4) and dark-gray (N 4/0) mottles; weak fine, subangular blocky structure; friable, slightly sticky and slightly plastic; thin patchy clay films on some ped faces; medium acid; clear, wavy boundary.

B22g—24 to 39 inches, dark-gray (N 4/0) light silty clay loam; many, fine, prominent, dark-brown (7.5YR 4/4) mottles; weak, fine, subangular blocky structure; friable, sticky and plastic; thin patchy clay films on ped faces; dark reddish-brown (5YR 3/4) coatings along root channels; medium acid; clear, wavy boundary.

C1g—39 to 46 inches, very dark grayish-brown (2.5Y 3/2) loam; many, medium and coarse, prominent, reddish-brown (5YR 4/4) and dark-brown (10YR 4/3) mottles; structureless; friable, sticky and plastic; slightly acid; abrupt, wavy boundary.

C2g—46 to 78 inches, grayish-brown (10YR 5/2) loam; many, medium and coarse, faint, yellowish-brown (10YR 5/4) mottles; structureless; friable, sticky and plastic; common red and black concretions; slightly acid; clear, wavy boundary.

IIC3—78 inches +, stratified, intermixed gravel, sand, silt, and clay.

Depth to bedrock ranges from 4 to 15 feet. The solum ranges from 25 to 40 inches in thickness. The reaction throughout the profile is medium acid to neutral. Colors of low chroma are immediately below the Ap or A2 horizon. The Ap horizon is mainly dark grayish brown but ranges to very dark grayish brown. It has hues of 10YR to 2.5Y. The matrix color of the B horizons ranges from gray to dark grayish brown or light grayish brown. These horizons are silty clay loam or silt loam. The C horizons are very dark grayish brown, grayish brown, or pale brown. Above the stratified sediments, the C horizons are clay loam or loam.

The poorly drained Melvin soils occur in close association on the flood plains with the moderately well drained Lindside soils and the somewhat poorly drained Newark soils. Melvin soils are also near the Chavies and Monongahela soils on terraces, and are more poorly drained than those soils.

Melvin and Newark silt loams (Mc).—These nearly level soils were mapped together as an undifferentiated mapping unit. Areas of the mapping unit may contain either Melvin or Newark soils or both kinds of soils in varying proportions. The areas are about 8 to 20 acres in size. The profile characteristics of each of these soils are described in their respective series. Wetness and flooding are the main limitations to most uses. (Capability unit IIIw–1)

Mine Dumps

Mine dumps (Md), a miscellaneous land type, are refuse piles of intermixed slate, shale, and coal from coal mining and piles of coke ashes from coking operations. These dumps are mostly in the western part of the county.

Mine dumps generally are steep or very steep and are devoid of vegetation. The waste materials that make up the dumps are very acid. All areas of these dumps are highly susceptible to erosion. The materials eroded from the dumps tend to clog stream channels and contribute to the pollution of streams.

All of the piles from coal mining have caught fire as a result of spontaneous combustion, and some are still burning. Mine dumps are not suited to farming or to forestry use. (Capability unit VIIIs–1)

Monongahela Series

The Monongahela series consists of deep, moderately well drained, loamy soils that formed on terraces in sediments deposited by rivers and smaller streams. These soils occur along rivers and smaller streams throughout the county. Monongahela soils are nearly level to sloping and have a slightly concave surface. Common trees are red oak, black oak, sycamore, soft maple, elm, sassafras, and dogwood. Common weeds are milkweed, ironweed, thistle, plantain, goldenrod, and ragweed.

A typical profile of a Monongahela soil has a dark grayish-brown silt loam surface layer about 7 inches thick. The upper part of the subsoil extends to a depth of 19 inches and is yellowish-brown, firm silty clay loam that is mottled with pale brown in the lower part. The lower part of the subsoil is between depths of 19 to 44 inches. It is mottled brown, very firm or extremely firm loam or clay loam. The underlying material is yellowish-red, loose sandy loam.

Monongahela soils are 5 to 15 feet or more deep to bedrock. The permeability is moderately slow in the fragipan. A water table rises to within 1½ to 3 feet of the surface when wetness is at its peak. The available moisture capacity is high. In some places rounded sandstone fragments occur throughout the profile.

These soils are suited to field crops. Heaving of alfalfa is severe in winter. Most areas of these soils are cultivated or in community development. Monongahela soils have limited potential for use as pond sites because the substratum is pervious. Limitations to use for onsite sewage disposal are severe because the fragipan has moderately slow permeability.

Representative profile of Monongahela silt loam, 3 to 8 percent slopes, moderately eroded, in a hayfield 1 mile east of Lowber:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable, slightly sticky and slightly plastic, strongly acid; abrupt, wavy boundary.

B21t—7 to 13 inches, yellowish-brown (10YR 5/8) silty clay loam; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin continuous clay films on ped faces; very strongly acid; clear, wavy boundary.

B22t—13 to 19 inches, yellowish-brown (10YR 5/8) silty clay loam; common, fine, faint, pale-brown (10YR 6/3) mottles; moderate, medium, prismatic structure parting to moderate, coarse, subangular blocky; firm, sticky and plastic; thick continuous clay films on ped faces; very strongly acid; abrupt, wavy boundary.

Bx1g—19 to 32 inches, brown (7.5YR 4/2) loam; common, medium, distinct, reddish-gray (5YR 5/2) mottles and common, fine, distinct, light-gray (10YR 7/1) mottles; moderate, coarse, prismatic structure parting to weak, thick, platy; extremely hard, very firm, slightly sticky and slightly plastic; thick, continuous, reddish-brown (5YR 5/3) and white (10YR 8/1) clay films on prism faces, and thick continuous clay films on ped faces; very strongly acid; abrupt, wavy boundary.

Bx2—32 to 44 inches, brown (7.5YR 4/4) clay loam; common, coarse, prominent, gray (10YR 6/1) mottles and common, medium, faint, weak-red (2.5YR 5/2) mottles; weak, coarse, prismatic structure parting to weak, medium, platy; extremely hard, extremely firm, sticky and plastic; thick, continuous, pinkish-gray (7.5YR

6/2) clay films on prism faces, and thick continuous clay films on ped faces; very strongly acid; abrupt, smooth boundary.

C—44 to 80 inches +, yellowish-red (5YR 5/8) sandy loam mottled with pinkish gray (5YR 6/2); single grain; loose, nonsticky and nonplastic; very strongly acid.

Depth to bedrock ranges from 5 to 15 feet or more. The solum ranges from 40 to 50 inches in thickness. Depth to the fragipan ranges from 18 to 26 inches. The reaction throughout the profile is strongly acid or very strongly acid. Mottles of low chroma occur at a depth of 17 to 30 inches. The B2t horizons range from yellowish brown to strong brown. These horizons are silty clay loam in most places, but they range to clay loam, loam, and fine sandy loam. The Bx horizons range from yellowish brown to brown in color, and are loam or clay loam. The C horizon is loam, sandy clay loam, or sandy loam.

The moderately well drained Monongahela soils occur in close association with the well drained Allegheny and Chavies soils. Monongahela soils also are near the Tyler and Purdy soils and are better drained than those soils.

Monongahela silt loam, 0 to 3 percent slopes (MoA).—This soil occupies terraces along rivers and smaller streams. The areas are about 8 to 20 acres in size. The profile of this soil has a thicker, darker colored surface layer than has the profile described as typical for the series. Included with this soil in mapping are areas of moderately well drained, very sandy soils. These included areas are mainly in the extreme northwestern part of the county on old terrace deposits.

This soil is suited to intensive use for crops. Most of it is farmland or in community development. (Capability unit IIw–2)

Monongahela silt loam, 3 to 8 percent slopes, moderately eroded (MoB2).—This soil commonly occupies terraces along rivers and smaller streams. It has the profile described as typical for the series. The areas are about 8 to 25 acres in size. Included with this soil in mapping are some moderately well drained, very sandy soils that are mostly in the extreme northwestern part of the county on old stream terraces.

This soil is suited to intensive use for crops. Most of it is cultivated or in community development. (Capability unit IIe–2)

Monongahela silt loam, 8 to 15 percent slopes, moderately eroded (MoC2).—This soil commonly is on terraces along rivers and smaller streams. The areas are mostly 10 to 25 acres in size. The profile of this soil has a thinner, lighter colored surface layer than has the profile described as typical for the series. Included with this soil in mapping are a few severely eroded areas of Monongahela soils and some small areas of deep, well-drained soils. This soil is suited to cultivation, which is its main use. (Capability unit IIIe–3)

Newark Series

The Newark series consists of deep, somewhat poorly drained, loamy soils that formed in stream deposits. These nearly level soils have a uniform or slightly concave surface. The Newark soils are on flood plains in the western part of the county. Common trees are sycamore, beech, alder, willow, hickory, walnut, and chokecherry. Other common plants are ironweed, swampgrass, milkweed, thistle, and plantain.

A typical cultivated Newark soil has a dark grayish-brown silt loam plow layer about 8 inches thick. The upper part of the subsoil extends to a depth of 26 inches and is brown and grayish-brown silty clay loam that is mottled. The lower part of the subsoil extends to a depth of 37 inches and is grayish-brown silty clay loam. This is underlain by very dark grayish-brown silt loam. At a depth of 51 inches is stratified, intermixed clay, silt, sand, and gravel.

Newark soils are flooded in spring and early in summer. A water table is within ½ to 1½ feet of the surface when wetness is at its peak. The permeability is moderately slow. Surface runoff is slow, and the erosion hazard is slight. The available moisture capacity is high. These soils range from strongly acid to slightly acid.

Newark soils have limited use for crops because of flooding and wetness. They are mostly in pasture or are idle. The potential for use as pond sites is limited because of flooding and a pervious substratum. Limitations to use for onsite sewage disposal are severe because of flooding and a high water table.

Representative profile of Newark silt loam in an area of Melvin and Newark silt loams in a nearly level cultivated field 6 miles south of Uniontown and near Gilmore:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine and medium, granular structure; friable, slightly sticky and slightly plastic; slightly acid; clear, wavy boundary.

B21—8 to 19 inches, brown (10YR 4/3) light silty clay loam; few, medium, distinct, light-gray or gray (10YR 6/1) mottles; weak, fine, subangular blocky structure; firm, slightly sticky and slightly plastic; strongly acid; clear, wavy boundary.

B22—19 to 26 inches, grayish-brown (10YR 5/2) silty clay loam; common, medium, faint, gray (N 5/0) and light-gray (10YR 6/1) mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; strongly acid; clear, wavy boundary.

B23g—26 to 37 inches, grayish-brown (2.5Y 5/2) light silty clay loam; many, coarse, prominent, gray (N 5/0), reddish-brown (5YR 4/3) and light-gray (10YR 6/1) mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; medium acid; clear, wavy boundary.

C1—37 to 51 inches, very dark grayish-brown (10YR 3/2) heavy silt loam; many, coarse, distinct, light-gray (10YR 6/1) and reddish-brown (5YR 4/3) mottles; structureless; friable, slightly sticky and slightly plastic; medium acid; abrupt, smooth boundary.

IIC2—51 to 72 inches +, stratified clay, silt, sand, and gravel.

Depth to bedrock ranges from 5 to 15 feet. The solum ranges from 30 to 40 inches in thickness. The Ap horizon is very dark grayish brown to grayish brown. The B21 horizon ranges from brown to yellowish brown. The B22 and B23g horizons range from dark grayish brown to brown and light brownish gray and, in some places, have mottles of high chroma that are yellowish red, reddish brown, and strong brown. The B2 horizons generally are silty clay loam but range to clay loam, silt loam, or loam. The C1 horizon ranges from very dark grayish brown to grayish brown in color and is silt loam, loam, or clay loam in texture.

The somewhat poorly drained Newark soils occur in close association on the flood plains with the moderately well drained Lindside soils and the poorly drained Melvin soils. Newark soils also are near Chavies and Monongahela soils on terraces, and are more poorly drained than those soils.

The Melvin and Newark soils were mapped together in an undifferentiated unit. The mapping unit is described under the Melvin series.

Philo Series

The Philo series consists of deep, moderately well drained, loamy soils on the flood plains. These soils formed in acid sediments that were derived from nearby sandstone

and shale upland areas and were deposited by streams. Philo soils are nearly level and have a uniform or slightly concave surface. These soils are on flood plains in the eastern part of the county. Common trees are sycamore, alder, willow, beech, hickory, white oak, hemlock, and soft maple. Other common plants are ironweed, thistle, plantain, swampgrass, milkweed, and goldenrod.

A typical profile of a cultivated Philo soil has a dark-brown silt loam plow layer about 8 inches thick. The subsoil extends to a depth of 28 inches and is friable, dark yellowish-brown silt loam and yellowish-brown loam. The underlying material is a grayish-brown, friable sandy loam. The subsoil, below a depth of 17 inches, and the underlying material are mottled with gray and yellowish brown.

Philo soils are subject to flooding. They are moderately permeable and have a water table that rises to within 1½ to 3 feet of the surface when wetness is at its peak. The available moisture capacity is moderate. These soils are strongly acid to extremely acid. In many areas Philo soils receive sediments and are affected by erosion only along streambanks.

These soils have limitations to use for crops because of flooding and wetness. They are mostly in trees. The potential for use as pond sites is limited because of the pervious underlying material and flooding. Limitations to use for onsite sewage disposal are severe because of flooding.

Representative profile of Philo silt loam in a nearly level cultivated field one-half mile north of Melcroft:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; numerous fine roots; strongly acid; clear, smooth boundary.

B21—8 to 17 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, medium, granular structure; friable, slightly sticky and slightly plastic; dark organic matter in large pores and crevices; very strongly acid; gradual, smooth boundary.

B22—17 to 28 inches, yellowish-brown (10YR 5/4) loam; common, medium, faint, light brownish-gray (10YR 6/2) and brownish-yellow (10YR 6/6) mottles; weak, medium, granular structure; friable, slightly sticky and nonplastic; extremely acid; clear, wavy boundary.

Cg—28 to 50 inches +, grayish-brown (10YR 5/2) sandy loam; many, coarse, distinct, gray (10YR 6/1) and light yellowish-brown (10YR 6/4) mottles; single grain; friable, nonsticky and nonplastic; extremely acid.

Depth to bedrock ranges from 5 to 15 feet. The solum ranges from 24 to 40 inches in thickness. The reaction throughout the profile is strongly acid to extremely acid. The Ap horizon ranges from dark brown to brown. The B horizons range from dark yellowish-brown to strong brown in color and from silt loam to sandy loam in texture. Mottles of low chroma are at a depth of 15 to 24 inches. The B horizons contain 0 to 20 percent rounded coarse fragments that increase in volume in the lower part of the horizons. The C horizon ranges from grayish-brown to yellowish-brown in color and from loam to loamy sand in texture. Rounded, coarse fragments make up 0 to 20 percent of the C horizon.

The moderately well drained Philo soils occur in close association on the flood plains with the poorly drained Atkins soils and the very poorly drained Elkins soils. The Philo soils are also near the Chavies and Monongahela soils on terraces. The Philo soils are more poorly drained than the Chavies soils and lack the fragipan that occurs in Monongahela soils.

Philo silt loam (Ph).—This nearly level soil is in areas about 10 to 30 acres in size. Included with this soil in mapping are areas of deep, well-drained soils on the flood plains and areas of soils having a loam or sandy loam surface layer. (Capability unit IIw-1)

Purdy Series

The Purdy series consists of deep, poorly drained, loamy soils that formed in old stream-deposited sediments. These nearly level soils occupy areas that have a uniform to slightly depressional surface. Some areas are near Fayette City, Brownsville, Connellsville, New Geneva, and Masontown. Common trees are white oak, laurel oak, elm, maple, beech, and sycamore. Other plants, which occur in open, idle fields, are cattail, swampgrass, ironweed, milkweed plantain, goldenrod, and deer tongue.

A typical cultivated Purdy soil has a dark-gray silt loam plow layer about 9 inches thick. From a depth of 9 to 13 inches is a mottled gray, friable silt loam subsurface layer. The subsoil, at depths between 13 to 55 inches, has grayish colors and is distinctly mottled, firm silty clay loam and clay loam.

Purdy soils are slowly permeable and have high available moisture capacity. Surface runoff and internal drainage are very slow. A water table is at or near the surface when wetness is at its peak. These soils are strongly acid to extremely acid. Heaving is severe in winter.

These soils are suited to limited use for crops. Crops that tolerate wet soils grow well. In most places these soils are idle or are in pasture. Purdy soils are well suited as sites for farm ponds.

Representative profile of Purdy silt loam in a nearly level cultivated field one-half mile northwest of Perryopolis; profile S64-Pa-26-2 (1-8) in tables 10 and 11 in the section "Laboratory Data":

Ap—0 to 9 inches, dark-gray (2.5Y 4/0) silt loam; moderate, fine and medium, granular structure; friable, slightly sticky and slightly plastic; strongly acid; abrupt, smooth boundary.

A2g 9 to 13 inches, gray (10YR 6/1) silt loam; few, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, thin and medium, platy structure; friable, slightly sticky and plastic; few, strong-brown (7.5YR 5/6) iron concretions 1 millimeter in diameter; many small insect burrows; strongly acid; clear, wavy boundary.

B21tg—13 to 19 inches, light brownish-gray (2.5Y 6/2) light silty clay loam; many, fine, distinct, gray (10YR 6/1) and yellowish-brown (10YR 5/4) mottles; weak, medium, prismatic structure parting to weak, medium, angular blocky; firm, slightly sticky and plastic; thin continuous clay films on ped faces; many small insect burrows; extremely acid; gradual, wavy boundary.

B22tg—19 to 25 inches, silty clay loam that has gray (10YR 6/1) ped faces and light brownish-gray (2.5Y 6/2) ped interiors; many, medium, faint, gray (10YR 6/1) mottles and many, medium, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky; firm, slightly sticky and plastic; thick continuous clay films on ped faces; extremely acid; gradual, wavy boundary.

B23tg—25 to 32 inches, silty clay loam that has gray (2.5Y 5/0) ped faces and grayish-brown (2.5Y 5/2) and strong-brown (7.5YR 5/6) ped interiors; many, fine, distinct, gray (2.5Y 5/0) mottles; strong, medium and coarse, prismatic structure parting to moderate, medium, angular blocky; firm, sticky and plastic; thick continuous clay films on ped faces; extremely acid; gradual, wavy boundary.

B24tg—32 to 40 inches, silty clay loam that has gray (2.5Y 5/0) ped faces and gray (2.5Y 6/0) ped interiors; few, fine, distinct, strong-brown (7.5YR 5/6) mottles; strong, medium, prismatic structure parting to moderate, medium, blocky structure; firm, slightly sticky and plastic; thick continuous clay films on ped faces; extremely acid; gradual, wavy boundary.

B25tg—40 to 50 inches, silty clay loam that has gray (2.5Y 6/0) ped faces and grayish-brown (2.5YR 5/2) ped interiors; many, fine and medium, distinct, strong-brown (7.5YR 5/6) mottles; moderate, coarse, prismatic structures parting to weak, medium, platy; firm, slightly sticky and slightly plastic; thick continuous clay films on ped faces; extremely acid; clear, wavy boundary.

B3g—50 to 55 inches +, clay loam that has gray (2.5Y 6/0) ped faces and grayish-brown (2.5Y 5/2) ped interiors; many, coarse, faint, gray (2.5Y 5/0) and strong-brown (7.5YR 5/6) mottles; moderate, coarse, prismatic structure parting to weak, medium, platy; firm, slightly sticky and slightly plastic; patchy clay films on ped faces; 5 percent cobblestones and boulders; extremely acid.

Depth to bedrock ranges from about 4 to 20 feet or more. The solum is 40 to 60 inches thick. In this county it is a few inches thicker than the defined range for the series, but this difference does not alter the usefulness or behavior of Purdy soils. Colors of low chroma are immediately below the Ap horizon. Reaction throughout the profile ranges from strongly acid to extremely acid. The B horizons range from gray to light brownish gray or grayish brown. The texture of these horizons centers on silty clay loam and ranges from clay loam to clay. In some places the C horizon is similar to the B horizons in color and texture.

The poorly drained Purdy soils occur in close association with the somewhat poorly drained Tyler soils and the moderately well drained Monongahela soils. Purdy soils also are near Atkins and Elkins soils. The Purdy soils are more poorly drained than Monongahela soils and lack their fragipan. They have more clay in the subsoil than Atkins and Elkins.

Purdy silt loam (Pu).—This nearly level soil is in areas about 10 to 30 acres in size. Included with this soil in mapping are a few small areas of gently sloping Purdy soils. (Capability unit IVw-1)

Rubble Land

Rubble land (Ru) is nearly level to sloping and has 90 percent or more of its surface covered with stones and boulders. Most of it is in the eastern part of the county where the underlying rock is massive sandstone. The areas mapped are about 10 to 20 acres in size. Rock escarpments are common inclusions. Few trees or other kinds of vegetation grow on this land. The stones and boulders are a foot to several feet in diameter. This land is best used for watershed and wildlife habitat because it is extremely stony. (Capability unit VIIIs-1)

Strip Mine Spoil

Strip mine spoil consists of soil areas that have been disturbed by excavating or stripping of soil and rock overburden to gain access to underlying beds of coal, limestone, fire clay, and shale.

After the strata desired are removed, the overburden is used for backfilling the excavation. A typical opened strip has a high wall or vertical cliff, a spoil pile, and a wide cut between the high wall and spoil pile. Strippings for coal normally curve around or along the slopes in successive bands.

Where the excavation has not been backfilled, surface runoff and ground water collect in the low positions. Water that drains from the coal strips is extremely acid and, in many places, contributes to the pollution of streams.

Acid strip mine materials generally are in the eastern part of Fayette County, and nonacid strip mine materials are in the western part. Spoil from limestone quarries, fire clay, and shale from mining operations were also mapped as strip mine spoil.

Revegetating Strip mine spoil is difficult because of acidity, stoniness, absence of organic matter, small amounts of available plant nutrients, low available moisture capacity, and the high temperature of the surface layer. Nonacid materials are easier to revegetate than the acid materials. Within a few years after stripping, nonacid materials are naturally revegetated with sweetclover and locust trees in some places.

Strip mine spoil requires onsite investigation to determine the hazards and limitations for specific uses.

Strip mine spoil, acid, undulating (SmB).—Areas of this land type have been backfilled to the original grade and contour. These areas are commonly on hilltops or bottom lands. At the surface are variable, acid soil material, coarse fragments, and some small coal particles. This material generally is high in sulfur and iron compounds.

This land is suited to trees, especially pines. In most places it is impractical and costly to build up the physical and chemical properties favorable for farming. Planting or seeding the extremely acid areas that are high in pyrites and other acid minerals is seldom successful until these minerals have decomposed and have been leached from the spoil. (Capability unit not assigned)

Strip mine spoil, acid, rolling (SmD).—Areas of this land type have mostly been backfilled to the original grade and contour. They commonly are moderately steep and occur on hillsides. The material normally consists of mixed soil and overburden that is high in compounds of sulfur and iron.

This land is suited to trees, especially pines. In many places it is impractical and costly to build up physical and chemical properties favorable for farming. Planting or seeding extremely acid areas high in pyrites and other acid material is seldom successful until these minerals have decomposed and have been leached from the spoil. (Capability unit not assigned)

Strip mine spoil, acid, steep (SmF).—Areas of this land type have not been backfilled to the original grade and contour. They may occupy any position on the landscape. The material normally consists of mixed overburden that is high in compounds of sulfur and iron.

This land is suited to trees, especially pines. In most places it is impractical and costly to build up the physical and chemical properties favorable for farming. Planting or seeding extremely acid areas that are high in pyrites or other acid minerals is seldom successful until these minerals have decomposed and have been leached from the spoil. (Capability unit not assigned)

Strip mine spoil, nonacid, undulating (SnB).—Areas of this land type have been backfilled to the original grade and contour. They occupy hilltops and bottom lands. The material consists of mixed soil and overburden. The overburden is variable and consists of soil material, sandstone, acid and calcareous shale, limestone, slate, and small coal fragments that generally are not very acid. This land also lacks the compounds of sulfur and iron that are in the acid strip mine spoil.

In most places, this land can be reclaimed for farm use, though reclamation depends largely on proper backfilling. (Capability unit not assigned)

Strip mine spoil, nonacid, rolling (SnD).—Areas of this land type generally have been backfilled to the original grade and contour, but some areas have been only partly backfilled. This mapping unit commonly is moderately steep and occurs on hillsides. Most of the material is mixed soil and overburden. The overburden is variable and consists of soil material, sandstone, acid and calcareous shale, limestone, slate, and small coal fragments that generally lack both the very acid material and the compounds of iron and sulfur that occur in the acid strip mine spoil.

In most places, this land can be reclaimed for farming, though reclamation depends largely on proper backfilling. (Capability unit not assigned)

Strip mine spoil, nonacid, steep (SnF).—Areas of this land type have not been backfilled. These areas may occupy any position on the landscape. Most of the material is mixed overburden consisting of sandstone, acid and calcareous shale, limestone, slate, and small coal fragments. This overburden generally lacks both the very acid material and the compounds of iron and sulfur that occur in the acid strip mine spoil.

This land is well suited to trees. Where it is not too steep and is properly backfilled, the land is suited to hay. (Capability unit not assigned)

Thorndale Series

The Thorndale series consists of deep, poorly drained, loamy soils of the uplands. These soils developed in soil materials that accumulated along narrow drainageways and at the base of steeper slopes. The soils were derived from mixed material weathered from sandstone, siltstone, limestone, and clay shale. Thorndale soils are nearly level to gently sloping and occur west of Chestnut Ridge. Common trees are black locust, chokecherry, walnut, elm, crab apple, hickory, and sycamore. Other plants include milkweed, ironweed, bluegrass, small white clover, goldenrod, and swampgrass.

A typical cultivated Thorndale soil has dark grayish-brown silt loam plow layer about 8 inches thick. The upper part of the subsoil extends to a depth of 26 inches and is mottled dark grayish-brown silty clay loam. The lower part of the subsoil extends to a depth of 41 inches and is a very firm, compact, silty clay loam fragipan. It is mottled with red, reddish brown, and brown. Underlying the subsoil is strong-brown and reddish-yellow silt loam.

Thorndale soils have a firm, slowly permeable subsoil and the water table is at or near the surface. They also have high available moisture capacity. Where the soils are not limed, they are strongly acid to medium acid. Tile lines help in draining wet and seepy areas. The tile intercepts water flowing on top of the fragipan. Where drained, these soils are suited to hay, but alfalfa is damaged by heaving in winter. Limitations to use for onsite sewage disposal are severe because of wetness and slow permeability.

Representative profile of Thorndale silt loam, 0 to 3 percent slopes, in a pasture field 1 mile west of Uniontown Hospital along State Route 21:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) silt loam; weak, medium, granular structure; friable, slightly sticky and slightly plastic; numerous fine roots; neutral; clear, smooth boundary.

B21tg—8 to 17 inches, silty clay loam that has dark grayish-brown (10YR 4/2) ped faces and pale-olive (5Y 6/3) ped interiors; common, medium, prominent, reddish-brown (5YR 4/4) mottles; moderate, coarse, subangular blocky structure; slightly firm, sticky and plastic; few medium and fine roots; thick continuous clay films on ped faces; slightly acid; clear, smooth boundary.

B22tg—17 to 22 inches, silty clay loam that has dark grayish-brown (2.5Y 4/2) prism and ped faces and pale-olive (5Y 6/3) ped interiors; common, fine, prominent, reddish-brown (5YR 4/4) mottles; weak, medium, prismatic structure parting to moderate, medium, subangular blocky; firm, sticky and plastic; very few fine roots; thick continuous clay films on prism and ped faces; slightly acid; clear, smooth boundary.

B23tg—22 to 26 inches, silty clay loam that has dark grayish-brown (10YR 4/2) prism and ped faces and pale-olive (5Y 6/3) ped interiors; common, medium, prominent, reddish-brown (5YR 4/4) mottles; weak, coarse, prismatic structure parting to moderate, medium and coarse, subangular blocky; firm, sticky and plastic; very few fine roots; thin continuous clay films on prism and ped faces; slightly acid; gradual, smooth boundary.

Bxg—26 to 41 inches, silty clay loam that has dark grayish-brown (10YR 4/2) prism and ped faces and grayish-brown (10YR 5/2) ped interiors; common, fine, distinct, red (2.5YR 4/6) mottles, common, medium, distinct, reddish brown (5YR 4/4) mottles, and common, medium, faint, brown (10YR 5/3) mottles; weak, coarse, prismatic-structure parting to weak, medium, subangular blocky; brittle and very firm, slightly sticky and slightly plastic; very few fine roots; thin continuous clay films on prism faces and thin patchy clay films on ped faces; slightly acid; abrupt, smooth boundary.

C—41 to 48 inches +, strong-brown (7.5YR 5/6) and reddish-yellow (7.5YR 7/6) silt loam; massive; friable, slightly sticky and slightly plastic; neutral.

Depth to bedrock ranges from about 4 to 15 feet. The solum is 40 to 50 inches thick. The fragipan is at a depth of 18 to 30 inches. Reaction throughout the profile is medium acid to neutral. Gleying begins below the Ap horizon or, where it occurs, the A2 horizon. A high water table rises to within 6 inches of the surface when wetness is at its peak. The Ap horizon is dark grayish brown or very dark grayish brown in hues of 10YR to 2.5Y. The ped coating in the Bt horizons are mostly dark grayish brown and grayish brown in hues of 10YR to 2.5Y. The ped interiors are pale brown, pale olive, or light brownish gray. Mottles that have a high chroma are yellowish red, reddish brown, and strong brown. The Bt horizons are silty clay loam or silt loam. The C horizon is strong brown, brown, or pale brown and has a texture of loam, silt loam, clay loam, or sandy clay loam.

Near the Thorndale soils are Westmoreland, Guernsey, Library, and Brooke soils. Thorndale soils are more poorly drained than those soils and have a fragipan that they lack.

Thorndale silt loam, 0 to 3 percent slopes (ThA).—The profile of this soil is the one described as representative of the Thorndale series. The soil surface is concave, and the areas are mostly 8 to 16 acres in size. A few areas of Thorndale silt loam, 3 to 8 percent slopes, moderately eroded, are included with this soil in mapping. Surface runoff is slow, and the erosion hazard is slight. This soil is suited as sites for farm ponds. (Capability unit IVw–1)

Thorndale silt loam, 3 to 8 percent slopes, moderately eroded (ThB2).—This soil occupies areas that have a concave surface. The areas have irregular shape. Most of the areas range from about 8 to 20 acres in size. The profile of this soil has a thinner, lighter colored surface layer than has the profile described as typical for the series. Included with this soil in mapping are small areas of Library silty clay loam, 2 to 8 percent slopes, moder-

ately eroded. Surface runoff is medium, and the erosion hazard is moderate. This soil is suited as sites for farm ponds. (Capability unit IVw–1)

Tyler Series

The Tyler series consists of deep, somewhat poorly drained, loamy soils that developed in sediments of mixed fine sand, silt, and clay that were deposited by slackwater. These nearly level soils are mostly west of Chestnut Ridge. They occupy uniform to slightly depressional areas of old stream terraces. Common trees are sycamore, willow, red oak, ash, yellow-poplar, and soft maple. Other common plants are swampgrass, ironweed, milkweed, plantain, goldenrod, deer tongue, and ragweed.

A typical cultivated Tyler soil has a dark grayish-brown silt loam plow layer about 7 inches thick. Below this and extending to a depth of 13 inches are light olive-brown silt loam and silty clay loam that are dominantly mottled with strong brown. Between depths of 13 and 31 inches are silty clay loam and silt loam that are dominantly grayish. Next is a very firm, compact fragipan that extends to a depth of 54 inches. It is gray to brown and has common mottles. Texture is silt loam in the upper part and gravelly loam below. The fragipan is underlain by dark-brown gravelly sandy loam that is about 40 to 55 percent gravel.

Tyler soils have a thick, slowly permeable subsoil, slow internal drainage, and high available moisture capacity. Surface runoff is slow, and the erosion hazard is slight. The water table rises to within 6 to 18 inches of the surface when wetness is at its peak. Tyler soils are generally strongly acid to very strongly acid. Tile lines, drainage terraces, and waterways help to drain these soils. If drained, they are suited to cultivated crops. Tyler soils are mostly cultivated and in community development. Limitations to use for onsite sewage disposal are severe because of wetness and slow permeability.

Representative profile of Tyler silt loam in a nearly level cultivated field 2 miles west of Connellsville; profile S64–Pa–26–4(1–10) in tables 10 and 11 in the section "Laboratory Data:"

Ap—0 to 7 inches, dark grayish-brown (2.5Y 4/2) silt loam, weak, fine, granular structure; friable, nonsticky and nonplastic; slightly acid; abrupt, smooth boundary.

B1—7 to 10 inches, light olive-brown (2.5Y 5/4) heavy silt loam; common, fine, distinct, strong-brown (7.5YR 5/6) and grayish-brown (10YR 5/2) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; strongly acid; clear, wavy boundary.

B21t—10 to 13 inches, light olive-brown (2.5Y 5/4) silty clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles and many, fine, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium, subangular blocky structure; friable, sticky and plastic; thin continuous clay film in pores; strongly acid; clear, wavy boundary.

B22tg—13 to 18 inches, silty clay loam that has grayish-brown (10YR 5/2) ped faces and yellowish-brown (10YR 5/4) ped interiors; many, medium, distinct, gray (10YR 6/1) mottles; weak, medium, prismatic structure parting to moderate, medium, blocky; slightly firm, slightly sticky and plastic; thin continuous clay films; strongly acid; clear, wavy boundary.

B23tg—18 to 25 inches, silty clay loam that has light-gray (N 6/0) ped faces and brown (7.5YR 5/4) ped interiors; many, medium, distinct, gray (10YR 6/1) mottles; moderate, coarse, prismatic structure parting to moderate, medium and fine, blocky; firm, slightly sticky and slightly plastic; thick clay films on some ped faces; many black coatings and concretions of iron and manganese; very strongly acid; clear, wavy boundary.

B24tg—25 to 31 inches, silt loam that has gray (N 6/0) prism faces and brown (7.5YR 5/4) ped interiors; common, medium, distinct, light-brownish gray (10YR 6/2) and gray (N 6/0) mottles; strong, coarse, prismatic structure parting to moderate, medium, angular blocky; firm, slightly sticky and slightly plastic; thin continuous clay films on ped faces; common black coatings and concretions of iron and manganese; very strongly acid; clear, wavy boundary.

Bx1g—31 to 36 inches, silt loam that has gray (N 6/0) prism faces and brown (7.5YR 5/4) ped interiors; common, medium, distinct, light brownish-gray (10YR 6/2) and gray (N 6/0) mottles; strong, coarse, prismatic structure parting to moderate, thick and medium, platy; very firm, slightly sticky and slightly plastic; thick continuous clay film on prism faces; few black iron and manganese concretions; 10 percent coarse fragments; strongly acid; clear, wavy boundary.

Bx2g—36 to 45 inches, gravelly loam that has brown (7.5YR 5/2) ped interiors and gray (N 6/0) coating on prisms, the outerface of which is reddish brown (5YR 4/3); strong, coarse, prismatic structure parting to moderate, thick and medium, platy; very firm, slightly sticky and nonplastic; thick clay films along prism faces and thin clay films on plates; many small concretions; 30 percent coarse fragments; strongly acid; clear, wavy boundary.

Bx3g—45 to 54 inches, gravelly loam that has dark-brown (7.5 YR 4/4) ped interiors and gray (N 6/0) prism faces; strong, coarse, prismatic structure parting to weak, medium, platy; very firm, nonsticky and nonplastic; many black coatings and concretions; 15 percent gravel; strongly acid; clear, wavy boundary.

C—54 to 60 inches +, dark-brown (7.5YR 4/4) gravelly sandy loam; massive; strongly acid; 40 to 55 percent gravel.

Depth to bedrock ranges from about 5 to 8 feet. The solum is 40 to 60 inches thick. A water table rises to within ½ foot to 1½ feet from the surface when wetness is at its peak. In areas not limed, reaction throughout the profile ranges from strongly acid to extremely acid. The Ap horizon centers on dark grayish brown and ranges from very dark grayish brown to light grayish brown in hues of 2.5Y to 10YR. Mottles of low chroma are immediately below the Ap horizon. The upper B horizons are brown, light olive brown, or yellowish brown. Below them, the B horizons are dominantly gray. The content of coarse fragments ranges from 0 to 5 percent in the Bt horizons and from 5 to 30 percent in the Bx horizons. Above the fragipan is silty clay loam or silt loam. The fragipan is clay loam, silt loam, silty clay loam, gravelly loam, or loam and is very firm to extremely firm.

The C horizon ranges from grayish brown to dark brown in color and is gravelly sandy loam, sandy loam, loam, and sandy clay loam in texture. This horizon has a content of coarse fragments ranging from 20 to 70 percent.

In this county the dominant colors in the upper B horizons of Tyler soils are higher in chroma than given in the defined range for the series, and both the upper and lower B horizons have a slightly higher content of clay. This difference, however, does not materially alter the usefulness and behavior of these soils.

The somewhat poorly drained Tyler soils occur in close association with the poorly drained Purdy soils and formed in similar materials. Tyler soils are near the Monongahela, Atkins, and Elkins soils. Tyler soils are more poorly drained than Monongahela soils and have a fragipan that the Atkins and Elkins soils lack. In addition, Tyler soils are not on flood plains, but the Atkins and Elkins soils are.

Tyler silt loam (Ty).—This nearly level soil is in areas about 8 to 30 acres in size. Included with this soil in mapping are a few areas of gently sloping Tyler soils and some areas of similar soils that do not have a fragipan. (Capability unit IIIw–2)

Upshur Series

The Upshur series consists of deep, well-drained, reddish, loamy soils that have a clayey subsoil and occur on the uplands. These soils developed in materials weathered in place from red calcareous shale, limestone, and sandstone. Most of these gently sloping to very steep soils are in the mountainous areas in the eastern part of Fayette County. Upshur soils occupy smooth to slightly convex upper slopes and drainage divides of mountains. They are mostly stony. Common trees are red oak, black oak, black locust, ash, yellow-poplar, soft maple, black walnut, and redbud.

A typical Upshur soil in a wooded area has a mat at the surface, about 1½ inches thick, consisting of leaf litter and black organic matter. The surface layer is very dark gray and dark reddish-brown silt loam about 7 inches thick. The subsoil extends to a depth of 26 inches and is reddish-brown and weak-red silty clay and shaly silty clay. The underlying material extends to a depth of 42 inches and is silty clay loam and about 65 percent thin fragments of shale. Red shale bedrock is at a depth of 42 inches.

Upshur soils have slow permeability and medium internal drainage. They have moderate natural fertility and are commonly neutral to medium acid. The available moisture capacity is moderate. In most places the stony Upshur soils have stones and boulders, a foot to several feet in diameter, on the surface and in the surface layer. These areas are in trees. Winter heaving is not a hazard on these soils. Upshur soils have limited potential for use as pond sites. Limitation to use for onsite disposal is severe.

Representative profile of Upshur silt loam, 15 to 25 percent slopes, moderately eroded, in a wooded area 2½ miles southeast of White House:

O1—1½ inches to 1 inch, hardwood leaf litter.

O2—1 inch to 0, black mull consisting of decomposed leaf litter.

A1—0 to 3 inches, very dark gray (5YR 3/1) silt loam; weak, fine, granular structure; friable, slightly sticky and slightly plastic; 5 percent rounded fragments of limestone up to 4 inches in diameter; neutral; clear, smooth boundary.

A2—3 to 7 inches, dark reddish-brown (5YR 3/2) silt loam; moderate, medium, granular structure; friable, slightly sticky and slightly plastic; neutral; abrupt, wavy boundary.

B21t—7 to 14 inches, reddish-brown (2.5YR 4/4) light silty clay; moderate, fine and medium, subangular and angular blocky structure; slightly firm, sticky and plastic; thick continuous clay films on ped faces; neutral; clear, wavy boundary.

B22t—14 to 22 inches, reddish-brown (2.5YR 4/4) silty clay; strong, medium and coarse, angular blocky structure; firm, sticky and plastic; very thick continuous clay films on ped faces; 3 percent fragments of rounded limestone up to 2 inches long; neutral; clear, wavy boundary.

B23t—22 to 26 inches, weak-red (2.5YR 4/2) shaly silty clay; strong, medium and coarse; angular blocky structure; firm, sticky and very plastic; thick continuous clay films on ped faces; 30 percent fragments of red shale; neutral; abrupt, wavy boundary.

C—26 to 42 inches, weak-red (10R 4/3) and greenish-gray (5G 5/1) fragments of thin shale; some silty clay loam between fragments; 65 percent shale; neutral; clear, wavy boundary.

R—42 inches +, thin-bedded, red, calcareous shale.

Depth to bedrock ranges from 3½ to 5 feet. The bedrock commonly is thin-bedded red or green shale, sandstone, and limestone. The solum is 24 to 40 inches thick. In wooded areas the A1 horizon is overlain by ½ to 2 inches of hardwood leaf litter and by 1 to 2 inches of black organic matter. The Ap horizon is dark reddish gray or reddish brown. The B horizons center on reddish brown, but they range to dusky red and weak red. They are silty clay or clay, but coarse fragments make up 0 to 35 percent of these horizons, by volume. The C horizon is mainly weak red and dusky red. It is silty clay loam or silty clay in most places. Coarse fragments make up 45 to 70 percent of the C horizon, by volume.

The Upshur soils occur in close association with Albrights, Hazleton, Gilpin, and Dekalb soils. Upshur soils are better drained than Albrights soils. The B horizons of the Upshur soils have reddish hues and are more clayey than the B horizons of the Hazleton, Gilpin, and Dekalb soils.

Upshur silt loam, 3 to 8 percent slopes, moderately eroded (UhB2).—This soil commonly occupies the lower lying areas on mountaintops. The areas are mostly 8 to 20 acres in size. The profile of this soil has a somewhat thicker subsoil and is deeper to bedrock than the profile described as typical for the Upshur series. Included with this soil in mapping are areas of severely eroded Upshur soils, small areas of Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded, and small areas of soils that are moderately well drained.

This soil is suited to crops such as corn and alfalfa. Farm use and management are limited mostly by slope. Most areas are cultivated or wooded. (Capability unit IIIe–2)

Upshur silt loam, 8 to 15 percent slopes, moderately eroded (UhC2).—This soil occupies the upper parts of hillsides and mountaintops. Areas are mostly 10 to 30 acres in size. The profile of this soil has a thicker subsoil and is slightly deeper to bedrock than is the profile described as typical for the series. Included with this soil in mapping are areas of severely eroded Upshur soils and areas of Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded.

This Upshur soil is suited to hay and to limited use for cultivated crops. Slope is the main limitation to use and management for farming. Most of this soil is cultivated or wooded. (Capability unit IVe–3)

Upshur silt loam, 15 to 25 percent slopes, moderately eroded (UhD2).—The profile of this soil is the one described as typical for the series. The soil commonly occupies mountainsides and hillsides. Areas are mostly 12 to 40 acres in size. Included with this soil in mapping are slightly eroded and severely eroded areas of Upshur soils. Also included are areas of Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded.

This Upshur soil is suited to hay. The main limitation to use for crops is slope. Most of this soil is in pasture or trees. Surface runoff is rapid, and the erosion hazard in cultivated areas is severe. (Capability unit VIe–2)

Upshur very stony silt loam, 0 to 8 percent slopes (UpB).—This soil commonly occupies the lower lying areas on mountaintops. The areas are mostly 12 to 25 acres in size. The profile of this soil has a somewhat thicker subsoil and is deeper to bedrock than is the profile described as typical for the series. Stones are too numerous for cultivation. They are a foot to several feet in diameter. Included with this soil in mapping are some areas of Gilpin very stony silt loam, 0 to 12 percent slopes. Cultivation of this Upshur soil is impractical because the soil is very stony, but it is suited to permanent pasture. Most of it is wooded. (Capability unit VIs–1)

Upshur very stony silt loam, 8 to 25 percent slopes (UpD).—This slightly eroded soil commonly occupies mountainsides and hillsides. The areas are mostly 25 to 75 acres in size. The profile of this soil is similar to that described as typical for the series except that it has stones on and in the surface layer. The stones, which range from a foot to several feet in diameter, make cultivation difficult and impractical. Included with this soil in mapping are areas of Gilpin very stony silt loam, 12 to 30 percent slopes.

This Upshur soil is suited to permanent pasture or trees. It is mostly wooded. (Capability unit VIs–1)

Upshur very stony silt loam, 25 to 50 percent slopes (UpF).—This soil commonly occupies mountainsides and hillsides. Areas are mostly 30 to 150 acres in size. The profile of this soil is similar to that described as typical for the series except that stones are on and in the surface layer and the subsoil is slightly thinner. The stones range from a foot to several feet in diameter. Included with this soil in mapping are areas of Gilpin very stony silt loam, 30 to 60 percent slopes. This Upshur soil is used for trees. (Capability unit VIIs–2)

Urban Land

Urban land is made up of soil areas that have had part or all of the original soil covered, moved, or graded by man. It includes land used for houses, shopping centers, factories, roads, streets, large cemeteries, railroads, deep mining, coking operations, and other uses in which the soils were disturbed. Nearly all of the Urban land is in the western part of Fayette County.

The original soil has been covered or destroyed by earth moving or construction operations. In some places the original soil is mixed with waste from mining, coking, and other operations. In some of these places soil has to be added if vegetation is to be established.

Urban land is so altered or obscured by earth moving and structures that identification of soils generally is not feasible. This land type is confined to the larger and closely built-up community developments.

Urban land, undulating (UrB).—This land type normally is on bottom lands and in other low-lying areas. The areas are about 10 to 100 acres in size. Included with this land type in mapping are some small areas that have been cut or filled with soil and trash and then smoothed. Some areas of this unit are subject to flooding. (Capability unit not assigned)

Urban land, rolling (UrD).—This land type occupies high bottom lands and sloping uplands. The areas are mostly 10 to 30 acres in size. Included with this land type in mapping are areas of Urban land that have slopes of more than 25 percent and small areas of earth and rock escarpments. Also included are some small areas that have been cut or filled with soil and trash and then smoothed. (Capability unit not assigned)

Weikert Series

The Weikert series consists of shallow, well-drained, loamy soils that formed in materials weathered in place from sandstone and shale bedrock. These steep and very steep soils are on the sides of hills and mountains. They are widely distributed throughout the county. Common trees are red oak, black oak, chestnut oak, white oak, dogwood, sassafras, and chokecherry.

A typical Weikert soil in pasture has a dark grayish-brown channery silt loam surface layer about 5 inches thick. The subsoil extends to a depth of 15 inches. It is yellowish-brown loam that has about 35 to 55 percent sandstone fragments. The underlying material is yellowish-brown loam and about 75 percent coarse fragments. Thin-bedded sandstone bedrock is at a depth of about 19 inches.

Weikert soils have moderately rapid permeability and low available moisture capacity. The water table is below a depth of 3 feet, and surface runoff is rapid. These soils are strongly acid. More than one-half of the lower part of the subsoil consists of sandstone fragments up to 6 inches long.

These soils are suited to trees and are used for pasture or woodland. They are not suited as sites for ponds. The limitations to use for onsite sewage disposal are severe.

Representative profile of a Weikert channery silt loam described in an area of Gilpin-Weikert channery silt loams having slopes of 30 to 60 percent in a pasture field 2½ miles southwest of New Salem:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) channery silt loam; weak, fine, granular structure; very friable, slightly sticky and slightly plastic; 25 percent coarse fragments; strongly acid; abrupt, smooth boundary.

B21—5 to 11 inches, yellowish-brown (10YR 5/4) channery loam: weak, medium and fine, subangular blocky structure; very friable, slightly sticky and nonplastic; very thin, patchy clay films on ped faces; 35 percent coarse fragments; strongly acid; clear, wavy boundary.

B22—11 to 15 inches, yellowish-brown (10YR 5/4) very channery loam; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; thin discontinuous clay films on ped faces; 55 percent coarse fragments; strongly acid; abrupt, wavy boundary.

C—15 to 19 inches, yellowish-brown (10YR 5/6) very channery loam; weak, medium, granular and subangular blocky structure; very friable, nonsticky and nonplastic; 75 percent coarse fragments; strongly acid; clear, wavy boundary.

R—19 inches +, thin-bedded sandstone.

Depth to bedrock ranges from 12 to 20 inches. In many places bedrock is sandstone and shale. The solum is 12 to 20 inches thick. Reaction throughout the profile ranges from medium acid to strongly acid. In wooded areas, ½ to 1 inch of hardwood leaf litter is on the surface and is underlain by ½ to 1 inch of black organic matter. The color of the B horizons centers on yellowish brown and ranges to light yellowish brown and pale brown. The B horizons are loam, silt loam, or silty clay loam and 30 to 65 percent coarse fragment, by volume. The content of coarse fragments normally increases with depth. The C horizon is similar to the lower part of the B horizon in color and texture but is 50 to 90 percent coarse fragments.

The shallow Weikert soils occur in an intricate pattern with the moderately deep Gilpin soils. Weikert soils also are near the Westmoreland, Upshur, and Dekalb soils and are shallower to bedrock than those soils.

In Fayette County the Weikert soils were mapped only in a complex, Gilpin-Weikert channery silt loams, 30 to 60 percent slopes. This complex is described under the heading "Gilpin Series".

Westmoreland Series

The Westmoreland series consists of deep, nearly level to sloping, well-drained, loamy soils that formed in material weathered in place from sandstone, shale, and lime-

stone in the uplands. These soils are in the western part of Fayette County near the coal fields. They occupy convex rounded tops and upper slopes of hills and upland benches. These soils have a large acreage in the county. Common trees are red oak, black oak, white oak, chokecherry, black locust, walnut, and elm. Bluegrass and white clover are common in permanent pasture.

A typical Westmoreland soil has a very dark grayish-brown channery silt loam surface layer about 7 inches thick. The subsoil extends to a depth of 40 inches and is yellowish-brown and strong-brown silt loam and loam. The underlying material is a yellowish-brown very channery loam.

Westmoreland soils have moderate permeability and moderate available moisture capacity. The water table normally is more than 3 feet from the surface. Where these soils are not limed, the surface layer normally is strongly acid. The lower part of the subsoil and the underlying material generally are medium acid and slightly acid. Natural fertility is moderate. Tillage is easy, and the erosion hazard is moderate.

Westmoreland soils are well suited to cultivated crops and are some of the best soils for grass in Fayette County. They are poorly suited as sites for ponds.

Representative profile of Westmoreland channery silt loam, 3 to 12 percent slopes, in a cultivated field one-half mile west of New Salem:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) channery silt loam, grayish brown (10YR 5/2) when dry; weak, fine, granular structure; soft, friable, slightly sticky and nonplastic; 20 percent sandstone fragments; strongly acid; abrupt, smooth boundary.

B1—7 to 10 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular and subangular blocky structure; friable, slightly sticky and slightly plastic; stains of organic matter on ped faces; 10 percent sandstone fragments; strongly acid; clear, wavy boundary.

B21t—10 to 14 inches, strong-brown (7.5YR 5/6) heavy silt loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; thin, continuous clay films on ped faces; few black concretions; 10 percent sandstone fragments; strongly acid; clear, wavy boundary.

B22t—14 to 21 inches, strong-brown (7.5YR 5/6) heavy loam; moderate, fine and medium, subangular blocky structure; slightly firm, slightly sticky and slightly plastic; thin continuous clay films on ped faces; common, fine, black concretions; 10 percent sandstone fragments; medium acid; clear, wavy boundary.

B23t—21 to 29 inches, strong-brown (7.5YR 5/6) heavy loam; moderate, medium, subangular blocky structure; slightly firm, slightly sticky and slightly plastic; thick continuous clay films on ped faces; common, fine, red and black concretions; black coatings on fragments; 10 percent sandstone fragments; slightly acid; clear, wavy boundary.

B24t—29 to 40 inches, strong-brown (7.5YR 5/6) heavy loam; moderate, medium, subangular blocky structure; slightly firm, slightly sticky and slightly plastic; thin continuous clay films on ped faces; many, fine and medium, black concretions; 10 percent sandstone fragments; medium acid; clear, wavy boundary.

C—40 to 52 inches +, yellowish-brown (10YR 5/4) very channery loam; 50 percent coarse fragments; medium acid.

Depth to bedrock ranges from 3½ to 5 feet. The bedrock is thin-bedded sandstone, shale, and limestone. The solum is not more than 40 inches thick. In wooded areas, 1 to 2 inches of leaf litter overlies 1½ to 3 inches of black organic matter. The Ap horizon ranges from very dark grayish brown to grayish brown. The B horizons are yellowish brown or strong brown and are loam, silt loam, or silty clay loam. The C horizon is brown or yellowish brown and is loam or sandy loam. Coarse sandstone fragments in the C horizon range from 30 to 60 percent, by volume.

The Westmoreland soils occur in close association with Brooke, Guernsey, and Library soils. In some places Westmoreland soils are near Hazleton soils. Westmoreland soils are better drained and contain less clay in the B horizon than Guernsey and Library soils. They are deeper and have less clay in the B horizon than Brooke soils and have less sand and more silt in the B horizon than Hazleton soils.

Westmoreland channery silt loam, 0 to 3 percent slopes (WcA).—This soil occupies broad hilltops. The areas are mostly 4 to 12 acres in size. The profile of this soil is similar to the profile described as typical for the series except that it is deeper to bedrock. Included with this soil in mapping are small areas of moderately eroded Westmoreland soils and areas of soils that have bedrock within 40 inches of the surface.

This soil is well suited to intensive farming. It is one of the better soils for farming in the county and is mostly cultivated. The limitations to use for onsite sewage disposal are moderate. (Capability unit I–1)

Westmoreland channery silt loam, 3 to 12 percent slopes (WcB).—This soil occupies broad hilltops. It is in areas that are mostly 8 to 20 acres in size. The profile of this soil is the one described as typical for the series. Included with this soil in mapping are small areas of severely eroded Westmoreland soils and a few, small areas of Westmoreland soils that have a shaly silt loam and channery sandy loam surface layer. Also included are areas of soils that have bedrock within 40 inches of the surface.

This soil is suited to intensive farming. It is one of the better soils for farming in the county and is mostly cultivated. The limitations to use for onsite sewage disposal are moderate. (Capability unit IIe–1)

Westmoreland channery silt loam, 12 to 20 percent slopes, moderately eroded (WcC2).—This soil occupies the upper slopes of hills and rounded hilltops. The areas are mostly 12 to 25 acres in size. The profile of this soil has a thinner subsoil and a lighter colored surface layer than has the profile described as typical for the series. Included in mapping are small areas of severely eroded Westmoreland soils, a few small areas of Westmoreland soils that have a shaly silt loam and channery sandy loam surface layer, and areas of soils that have bedrock within 40 inches of the surface.

This soil is suited to cultivation. It is one of the better soils for farming in the county and is mostly cultivated. The limitations to use for onsite sewage disposal are moderate. (Capability unit IIIe–1)

Westmoreland channery silt loam, 20 to 30 percent slopes, moderately eroded (WcD2).—This soil occupies the upper slopes of hills. Areas are mostly 12 to 30 acres in size. The profile of this soil has a thinner subsoil and a lighter colored surface layer than the profile described as typical for the series. Included with this soil in mapping are small areas of severely eroded Westmoreland soils, a few, small areas of a Westmoreland soil that has a shaly silt loam surface layer, and areas of soils that have bedrock within 40 inches of the surface.

This soil is suited to hay and to limited use as cropland. It is one of the better soils for hay in the county and is mostly cultivated and wooded. The limitations to use for onsite sewage disposal are severe. (Capability unit IVe–1)

Wharton Series

The Wharton series consists of deep, moderately well drained soils of the uplands that formed in material weathered in place from shale, siltstone, and some sandstone. These soils have a loamy surface layer and a dominantly clayey subsoil. They are mainly in the western part of Fayette County between Chestnut Ridge and Laurel Hill. These nearly level to steep soils occupy hilltops, upland benches, and lower slopes. Common trees are elm, cucumber tree, hickory, ash, red oak, black oak, red maple, and yellow-poplar.

A typical Wharton soil has a dark-brown, silt loam surface layer about 7 inches thick. The upper part of the subsoil, between depths of 7 and 25 inches, is yellowish-brown silty clay loam and silty clay that are mottled at a depth of 19 inches. The middle part of the subsoil extends to a depth of 36 inches and is yellowish-brown and strong-brown silty clay that is mottled. The lower part of the subsoil is mottled light-gray silty clay loam and shaly silty clay loam. The subsoil is immediately underlain by bedrock of firm, grayish-brown, acid shale.

Wharton soils have slow permeability and moderate available moisture capacity. The water table is within 1½ to 3 feet of the surface when wetness is at its peak. Bedrock is within 4 to 6 feet of the surface. Where these soils are not limed, the surface layer is strongly acid. Natural fertility is low. If the steeper soils are cultivated, the erosion hazard is severe. Where tilled when wet, these soils become cloddy and compact. Wharton soils are not easily leached. Heaving is severe in winter.

These soils are suited to general farming. They have limitations for pond sites. The limitations to use for onsite sewage disposal are severe.

Representative profile of Wharton silt loam, 8 to 15 percent slopes, moderately eroded, in a hayfield three-fourths mile south of the town of Mill Run and along L. R. 381; profile S64–Pa–26–7 (1–8) in tables 10 and 11 in the section "Laboratory Data:"

Ap—0 to 7 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable, slightly sticky and slightly plastic; 2 percent coarse fragments; neutral; abrupt, smooth boundary.

B21t—7 to 13 inches, yellowish-brown (10YR 5/8) silty clay loam; moderate, medium, subangular blocky structure; slightly firm, very sticky and very plastic; thin continuous clay films on ped faces and in pores; 2 percent coarse fragments; medium acid; clear, wavy boundary.

B22t—13 to 19 inches, yellowish-brown (10YR 5/8) silty clay; moderate, medium, angular blocky structure; firm, very sticky and very plastic; thin continuous clay films on ped faces and in pores; 2 percent coarse fragments; very strongly acid; clear, wavy boundary.

B23t—19 to 25 inches, yellowish-brown (10YR 5/6) silty clay; few, fine, distinct, light-gray (10YR 7/1) mottles; weak, medium, prismatic structure parting to moderate, medium, angular blocky; firm, very sticky and very plastic; thick continuous clay films on ped faces; thin iron and manganese concretions; 2 percent coarse fragments; very strongly acid; clear, wavy boundary.

B24t—25 to 30 inches, yellowish-brown (10YR 5/6) silty clay; common, fine, distinct, light-gray (10YR 7/1) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky structure; firm, very sticky and very plastic; thick continuous clay films on ped faces; many fine concretions of iron and manganese; 5 percent coarse fragments; very strongly acid; abrupt, wavy boundary.

B25t—30 to 36 inches, strong-brown (7.5YR 5/6) silty clay; many, fine, distinct, light yellowish-brown (10YR 6/4), light-gray (10YR 7/1), and yellowish-red (5YR 4/6) mottles; strong, medium, angular blocky structure; firm, very sticky and very plastic; thick continuous clay films on ped faces; 2 percent coarse fragments; very strongly acid; abrupt, wavy boundary.

B26tg—36 to 42 inches, silty clay loam that has light-gray, (10YR 7/1) ped interiors and prism faces; common, fine and medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; strong, medium, prismatic structure parting to strong, medium, angular blocky; firm, sticky and plastic; thick continuous clay films on ped faces; few iron and manganese concretions; very strongly acid; abrupt, wavy boundary.

B27g—42 to 50 inches, shaly silty clay loam that has light-gray (10YR 7/1) ped interiors and prism faces; common, fine and medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; moderate, medium, prismatic structure; firm, sticky and plastic; common iron and manganese concretions and coatings, primarily on coarse fragments; 30 percent shale and sandstone fragments; very strongly acid; abrupt, smooth boundary.

R—50 inches +, firm, grayish-brown, acid shale.

Depth to bedrock ranges from 4 to 6 feet. The bedrock is mostly clay shale and thin-bedded, grayish-brown sandstone. The solum ranges from 40 to 54 inches in thickness. Mottles of low chroma begin at a depth of 15 to 20 inches. In wooded areas 1 to 2 inches of hardwood leaf litter lies over 1 to 3 inches of black organic matter. The A2 horizon, where present, is very dark grayish brown or dark grayish brown. The Ap horizon is dark brown or dark grayish brown. The upper B horizons are yellowish brown, brown, or strong brown. The lower B horizons are gray, grayish brown, or brown. The mottles in the B horizons include light gray, yellowish brown, reddish brown, strong brown, and yellowish red. The B horizons are silty clay loam, silty clay, clay, or clay loam. The C horizon is commonly gray, light grayish brown, or grayish brown, and its mottles are similar to those of the B horizons in color. The C horizon is mostly silty clay loam, clay loam, or silty clay. Coarse fragments in the C horizon are commonly shale, and they make up from 30 to 60 percent of the horizon, by volume.

The moderately well drained Wharton soils occur in close association with the Gilpin, Cavode, and Armagh soils. Wharton soils also are near the Hazleton, Clymer, and Dekalb soils. The Wharton soils are better drained than the Cavode and Armagh soils, but they are wetter and contain more clay in the B horizons than the Gilpin, Dekalb, Hazleton, and Clymer soils. Also, Wharton soils are deeper than the Gilpin and Dekalb soils.

Wharton silt loam, 0 to 3 percent slopes (WrA).—This soil occupies broad hilltops and drainage divides. The areas are mostly 6 to 12 acres in size. Included with this soil in mapping are small areas of nearly level Cavode soils.

This soil is suited to crops. It is mostly cultivated and wooded. Surface runoff and internal drainage are slow. Erosion is only a slight hazard in cultivated areas. (Capability unit IIw–2)

Wharton silt loam, 3 to 8 percent slopes, moderately eroded (WrB2).—This soil occupies broad hilltops and drainage divides. The areas are mostly 10 to 20 acres in size. Included with this soil in mapping are small areas of severely eroded Wharton soils and some areas of Cavode silt loam, 3 to 8 percent slopes, moderately eroded.

Although the erosion hazard is moderate in cultivated areas, this soil is suited to crops. It is mostly cultivated and wooded. (Capability unit IIe–2)

Wharton silt loam, 8 to 15 percent slopes, moderately eroded (WrC2).—The profile of this soil is the one described as typical for the series. The soil occupies the roll-

ing hilltops, lower slopes, and some of the upper slopes of the lower lying hills. The areas are about 10 to 30 acres in size. Included with this soil in mapping are small areas of severely eroded Wharton soils. (Capability unit IIIe-3)

Wharton silt loam, 15 to 25 percent slopes, moderately eroded (WrD2).—This soil occupies the lower slopes and some of the upper slopes of the lower lying hills. The areas are mostly 10 to 30 acres in size. The profile of this soil has a thinner subsoil and a thinner, lighter colored surface layer than has the profile described as typical for the series. Included with this soil in mapping are small areas of severely eroded Wharton soils and areas of moderately well drained, coarser textured soils that have a fragipan.

This soil is suited to hay and to limited use for row crops. It is mostly wooded, but some areas are cultivated. Surface runoff is rapid, and the erosion hazard is moderate to severe in cultivated areas. (Capability unit IVe-2)

Wharton silt loam, 25 to 35 percent slopes, moderately eroded (WrE2).—This soil occupies lower slopes. The areas are mostly 15 to 30 acres in size. The profile of this soil has a thinner subsoil and a thinner, lighter colored surface layer than does the profile described as typical for the series. Included with this soil in mapping are small areas of severely eroded Wharton soils and some areas of Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded.

This soil is suited to pasture, but most of it is wooded. Surface runoff is rapid, and the erosion hazard in cultivated areas is severe. (Capability unit VIe-1)

Wharton very stony silt loam, 0 to 8 percent slopes (WsB).—This soil occupies broad hilltops, drainage divides, and upland benches. The areas are mostly 10 to 30 acres in size. The profile of this soil is similar to the one described as typical for the series but has stones on the surface and in the surface layer, and also a thin covering of leaf litter and raw humus. The stones and boulders are a foot to several feet in diameter.

This soil is well suited to permanent pasture. It is too stony for cultivation. Most of this soil is in trees, but some is in pasture. (Capability unit VIs-2)

Wharton very stony silt loam, 8 to 30 percent slopes (WsE).—This soil occupies the lower slopes of hills and mountains and some upper slopes of the lower lying hills. The areas are mostly 25 to 50 acres in size. The profile of this soil is similar to the profile described as typical for the series except that stones are on the surface and in the surface layer, and there is a thin surface covering of leaf litter and raw humus. The stones and boulders on this soil are a foot to several feet in diameter. Included with this soil in mapping are a few, small areas of Cavode soils that have a very stony surface layer.

This soil is suited to permanent pasture. It is too stony for cultivation, and most of it is wooded. (Capability unit VIs-2)

Formation and Classification of the Soils

In this section the factors of soil formation and their relation to the soils in Fayette County are discussed, and some of the processes of soil formation are described. Also, the classification of the soils currently used by the Soil Conservation Service and others is described, and soil series represented in the county are placed in some categories of the current system.

Formation of Soils

Soils formed through the interaction of five major factors: climate, plant and animal life, parent material, topography, and time. The relative influence of each factor normally varies from place to place. Local variations in soils are the result of the effects of differences in kind of parent material and in topography and drainage. In places one factor may dominate the formation of a soil and determine most of its properties.

Climate

The climate of Fayette County is humid and continental, and it is marked by extreme seasonal changes of temperature. The annual precipitation varies from about 37 to 40 inches along the Monongahela River to 42 inches at the higher elevations of Chestnut Ridge and Laurel Hill. The rainfall is fairly uniform during the growing season of May through September. In the area west of Chestnut Ridge, average annual temperature is about 54° F., but it decreases to approximately 50°, at the higher eastern elevations. This cool temperature has promoted the accumulation of organic matter in the surface layer of the soils. For more detailed information on climate, see the section "General Nature of the County."

Plant and animal life

All living organisms affect soil formation. These include vegetation, animals, bacteria, and fungi. The vegetation strongly affects the content of organic matter, color of the surface layer, and the amount of plant nutrients in soils. Animals, such as earthworms, cicada, and burrowing animals, help keep the soil open and porous. Bacteria and fungi decompose the vegetation and release nutrients for plant use. In Fayette County the native forests have been a major influence on soil formation. The soils of the county are typical of soils developed under forest vegetation. The organic matter, which comes from decomposed leaves and twigs, is concentrated near the surface. As the forests were cleared and farmed, the leaf litter and mineral layers highest in organic-matter content were mixed where the soils were plowed.

Parent material

Parent material is the unconsolidated masses from which the soils are formed. It determines the mineralogical and chemical composition of the soil and to a large extent the rate that soil-forming processes take place.

In Fayette County, most of the soils developed in residium derived from folded sedimentary rocks; namely, sandstone, siltstone, shale, and limestone.

Some of the soils that were derived from sedimentary rocks are strongly influenced by limestone strata. Examples of such soils are in the Westmoreland, Guernsey, Brooke, Library, and Thorndale series. Gilpin, Wharton, and Cavode soils formed in material that weathered from shale and thin strata of sandstone. The Gilpin, Wharton, and Cavode soils have lower natural fertility and lower

base saturation in the substratum than have the soils influenced by limestone. Also formed in material weathered from sedimentary rocks are the Hazleton and Dekalb soils in the eastern part of the county. These soils contain a considerable number of coarse fragments and were derived from sandstone and conglomerate.

Some soils in the county formed in materials that slipped or otherwise moved downhill to lower positions on hillsides. Examples are Albrights, Buchanan, Brinkerton, and Ernest soils. These soils are loamy and have a fragipan and restricted drainage.

Among the soils that formed in unconsolidated silt, clay, sand, and gravel on the flood plains are the Atkins, Elkins, Lindside, Melvin, Newark, and Philo soils. Allegheny and Monongahela soils formed in stream terrace deposits of sand and silt. Purdy and Tyler soils formed in the silty and clayey materials that were deposited by slack water or in old lakes. These soils are slowly permeable and have restricted drainage.

Topography

The shape of the land surface, commonly called the lay of the land, percentage of slope, and position in relation to the water table had much influence on the formation of soils in the county. Soils formed in sloping areas where runoff is medium to rapid generally are well drained, have a bright-colored, unmottled subsoil, and are deeply leached in most places. Gilpin, Hazleton, and Westmoreland soils are examples. In more gently sloping areas where runoff is slower, the soils generally are mottled in the subsoil or show some other evidence of saturation by water for short periods. Wharton, Cookport, and Guernsey soils are examples. In level areas or slight depressions where the water table is at or near the surface for long periods, the soils show evidence of wetness to a marked degree. They have a fairly dark-colored surface layer and a strongly mottled or grayish subsoil. Brinkerton and Elkins soils are of this kind. Also, the permeability of the soil materials, as well as the length, steepness, and shape of the slopes, influenced the kind of soil that formed in an area. In this county local differences in soils are largely the result of differences in parent material and topography.

Time

The formation of soils requires time for changes to take place in the parent materials. This time, measured in years, normally is long. Many soils of Fayette County developed during a relatively long time. Evidence of this can be seen in the soils that are well developed, or mature.

Soils formed on low bottom lands and subject to varying degrees of flooding may receive new sediments from each flood. These soils have only weak soil structure and weak differences in color of horizons. An example is the Philo soils. Soils that have well-developed soil horizons, such as the Guernsey, have developed for longer periods than the Philo soils.

Processes of Soil Formation

This subsection contains a brief description of the major soil horizons, and a description of the processes that have much to do with the development of these horizons.

Major soil horizons

The effects of the five soil-forming factors can be distinguished by the different layers, or soil horizons, that are seen in a soil profile. The soil profile extends from the surface downward to materials that are little altered by the soil-forming processes.

Most soils contain three major horizons called A, B, and C. These major horizons may be further subdivided by the use of numbers and letters that indicate important characteristics of the subdivided horizons. An example is the B2t horizon, which designates a layer within the B horizon containing clay translocated from the A horizon.

The A horizon is the surface layer. That part of the A horizon having the largest accumulation of organic matter is called the A1 horizon. The A2 horizon is the layer of maximum leaching or eluviation of clay and iron. The A2 horizon of many soils in Fayette County shows grayish-brown colors that is a result of oxidation of iron and subsequent leaching into the B horizon.

If a B horizon occurs in a soil, it lies underneath the A horizon and is commonly called the subsoil. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, or other compounds that were leached from the A horizon. In some soils the B horizon was formed by the alteration of material in place instead of illuviation. This alteration may be the result of oxidation and reduction of iron or the weathering of minerals. The B horizon generally has blocky or prismatic structure. It normally is firmer and lighter colored than the A1 horizon, but darker than the C horizon. In the youngest soils a B horizon has not developed.

The C horizon is below the B horizon. It consists of materials that were little altered by the soil-forming processes, though the materials may be modified by weathering.

Processes of horizon development

Several processes affected the formation of soil horizons in the soils of Fayette County. These include gains, losses, transfers, and transformations of components of the soil material. Gains occur where organic matter is accumulated. Losses occur where soluble salts are leached from the soil. Transfers occur where clay is moved to lower horizons. Transformations occur where iron is oxidized or reduced. These processes are continually taking place, generally at the same time throughout the profile.

Organic matter is accumulated where plant residue decomposes. This process darkens the surface layer and helps form the A1 horizon. A long time is required to replace organic matter that has been lost.

Where soils have distinct soil horizons, it is believed that some of the lime and other soluble salts were leached before clay minerals were translocated. Among the many factors that affect this leaching are the kinds of salts originally present, the depth to which the soil solution percolates, and the texture of the soil profile.

An important process in the formation of soil horizons in Fayette County is the formation and translocation of silicate clay minerals. The kinds and amount of clay minerals in a soil profile depend on the kind and amount of minerals in the parent materials, but the amount of clay varies from one soil horizon to another. Clay minerals are generally moved from the A horizon down into the B.

Evidences of such movement are higher actual amounts of clay in the B horizon and, in many soils, clay films on the ped faces and in the pores and root channels. In some soils an A2 horizon has formed because considerable clay and iron minerals have been eluviated from the A horizon to the B. The A2 horizon is light colored and, in many places, has platy structure. Clay films in the B22t horizon of Westmoreland channery silt loam are evidence of clay mineral translocation.

The oxidation and reduction of iron mainly depends on the height of the water table in the soil. Dekalb, Westmoreland, and other well-drained soils have a strong-brown or yellowish-brown B horizon. These colors indicate the presence of oxidized iron compounds and the absence of a water table within the profile. Gray mottles in brown or red soils indicate some reduction of iron because the water table is seasonally high. The Armagh and other poorly drained soils have a grayish B horizon that indicates iron was reduced because the water table was high the year round.

Classification of Soils

Soils are classified so that we may more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationships to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The system of soil classification currently used defines soils in terms of observable or measurable properties (*12*, *19*). This system is described in this section. It was developed for general use by the National Cooperative Soil Survey in 1965. This system is under constant study; therefore, readers interested in the development of the system should search for the latest revisions. The properties chosen are primarily those that permit the grouping of soils that are similar and have developed under similar conditions. Genesis, or mode of soil origin, does not appear in the definition of the classes; it lies behind the classes. The classification is designed to accommodate all soils. It employs a unique nomenclature that is both connotative and distinctive.

In table 10, the soil series of Fayette County are placed in some categories of the current system. Placement of some soil series in this system may change as more precise information becomes available.

TABLE 10.—*Classification of the soils*

Series	Family	Subgroup	Order
Albrights	Fine-loamy, mixed, mesic	Aquic Fragiudalfs	Alfisols.
Allegheny	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Andover	Fine-loamy, mixed, mesic	Typic Fragiaquults	Ultisols.
Armagh	Clayey, mixed, mesic	Typic Ochraquults	Ultisols.
Atkins	Fine-loamy, mixed, acid, mesic	Fluventic Haplaquepts	Inceptisols.
Brinkerton	Fine-silty, mixed, mesic	Typic Fragiaqualfs	Alfisols.
Brooke	Fine, mixed, mesic	Mollic Hapludalfs	Alfisols.
Buchanan	Fine-loamy, mixed, mesic	Aquic Fragiudults	Ultisols.
Cavode	Clayey, mixed, mesic	Aeric Ochraquults	Ultisols.
Chavies	Coarse-loamy, mixed, mesic	Ultic Hapludalfs	Alfisols.
Clarksburg	Fine-loamy, mixed, mesic	Aquic Fragiudalfs	Alfisols.
Clymer	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Cookport	Fine-loamy, mixed, mesic	Aquic Fragiudults	Ultisols.
Dekalb	Loamy-skeletal, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Elkins	Fine-silty, mixed, acid, mesic	Humic Haplaquepts	Inceptisols.
Ernest	Fine-loamy, mixed, mesic	Aquic Fragiudults	Ultisols.
Gilpin	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Guernsey	Fine, mixed, mesic	Aquic Hapludalfs	Alfisols.
Hazleton	Coarse-loamy, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Library	Fine, illitic, mesic	Aeric Ochraqualfs	Alfisols.
Lindside	Fine-silty, mixed, mesic	Aquic Fluventic Eutrochrepts	Inceptisols.
Melvin	Fine-silty, mixed, nonacid, mesic	Fluventic Haplaquepts	Inceptisols.
Monongahela	Fine-loamy, mixed, mesic	Typic Fragiudults	Ultisols.
Newark	Fine-silty, mixed, nonacid, mesic	Aeric Fluventic Haplaquepts	Inceptisols.
Philo	Coarse-loamy, mixed, acid, mesic	Aquic Fluventic Dystrochrepts	Inceptisols.
Purdy [1]	Clayey, mixed, mesic	Typic Ochraquults	Ultisols.
Thorndale	Fine-silty, mixed, mesic	Typic Fragiaqualfs	Alfisols.
Tyler [2]	Fine-silty, mixed, mesic	Typic Fragiaquults	Ultisols.
Upshur	Fine, mixed, mesic	Typic Hapludalfs	Alfisols.
Weikert	Loamy-skeletal, mixed, mesic	Lithic Dystrochrepts	Inceptisols.
Westmoreland	Fine-loamy, mixed, mesic	Ultic Hapludalfs	Alfisols.
Wharton	Clayey, mixed, mesic	Aquic Hapludults	Ultisols.

[1] The Purdy soils in Fayette County have a solum that is a few inches thicker than the defined range for the series, but this difference does not alter their usefulness and behavior. They are considered taxadjuncts to the Purdy series.

[2] In the Tyler soils in Fayette County the upper part of the B horizons has dominant colors of higher chroma than that in the defined range for the series. Also there is a larger percentage of sand in the B horizon. These differences do not materially alter the usefulness and behavior of the Tyler soils in the county. They are considered taxadjuncts to the Tyler series.

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The classification has six categories. Beginning with the most inclusive, the categories are the order, suborder, great group, subgroup, family, and series. Classes of the current system are briefly defined in the following paragraphs.

ORDERS. Ten soil orders are recognized. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Exceptions are the Entisols, Histosols, and, to some extent, Inceptisols, which occur in many different climates. Each order is named with a word of three or four syllables ending in *sol* (Ult-i-sol).

Table 10 shows the three soil orders in Fayette County: Inceptisols, Alfisols, and Ultisols. In most places Inceptisols are on young, but not recent, land surfaces; hence, their name was derived from the Latin *inceptum*, for beginning. In Fayette County this order includes soils formerly called Alluvial soils, Humic Gley soils, Sols Bruns Acides, and Low-Humic Gley soils (*4*), (*14*).

Alfisols are soils that have a clay-enriched B horizon that is high in base saturation. In Fayette County this order includes all of the soils that have been called Gray-Brown Podzolic soils and many of the soils that were formerly called Low-Humic Gley soils.

Ultisols are soils that have a clay-enriched B horizon that is low in base saturation. In Fayette County, this order includes all of the soils that have been called Gray-Brown Podzolic soils and Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils. Some that were called Low-Humic Gley soils also are Ultisols.

SUBORDERS. Each order is subdivided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is Aquepts (*Aqu* meaning wet and *ept* from Inceptisols).

GREAT GROUPS. Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus has accumulated or those that have pans that interfere with growth of roots or movement of water. The features used are the self-mulching properties of clays, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Fragiaquept (*Fragi* meaning fragipan; *aqu* for wet, and *ept* from Inceptisols). The great group is not shown separately in table 10, because it is the last word in the name of the subgroup.

SUBGROUPS. Great groups are subdivided into subgroups, one representing the central (typic) segment of the group and others called intergrades that have properties of the group and also have one or more properties of another group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Fragiaquept (a typical Fragiaquept).

FAMILIES. Families are separated within a subgroup, primarily on the basis of properties important to the growth of plants or behavior of soils where used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives, which is the class name for texture, mineralogy, and so on (see table 10). An example is the fine-loamy, mixed, mesic family of Typic Fragiaquepts.

SERIES. The series consists of a group of soils that formed in a particular kind of parent material and that have genetic horizons that, except for the texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile. Among these characteristics are color, structure, reaction, consistence, and mineralogical and chemical composition.

Laboratory Data[6]

The physical and chemical properties of the soils of five series at selected sites in Fayette County are given in tables 11 and 12. The series sampled are the Chavies, Hazleton, Purdy, Tyler, and Wharton. The sites of samplings were in areas that are most nearly representative of the soil series in internal characteristics and in slope, erosion, and land use. At each site a pit was dug through the solum and into the parent material. Descriptions were taken and samples were collected from each horizon described.

A description of the profile of each soil that was sampled is given in the section "Descriptions of the Soils." Also given are the sample numbers of each profile sampled.

Methods of Analysis

Air-dry samples were crushed so that soil material would pass through a 2-millimeter sieve. Care was taken to avoid breaking the rock fragments that were larger than 2 millimeters. The percentage by weight of fragments larger than 2 millimeters was determined and reported in table 11 as percent coarse fragments by weight. All other determinations in tables 11 and 12, except those for bulk density and moisture retention at 1/3 atmosphere, were made on the part of the sample consisting of soil particles less than 2 millimeters in diameter.

Particle-size distribution was determined by the pipette method (*8*) after dispersion by sodium metaphosphate and mechanical shaking.

Bulk density, expressed in grams per cubic centimeter, was determined on triplicate 1- by 2-inch cylindrical core samples. The samples were taken with a modified Uhland core sampler (*15*).

Moisture held at 1/3 atmosphere of tension was determined by using a pressure-plate apparatus (*17*) on the 1-

[6] Samples were collected and laboratory analyses and interpretations were made at the Soil Characterization Laboratory of the Pennsylvania State University by R. P. MATELSKI, R. L. CUNNINGHAM, R. W. RANNEY, L. J. JOHNSON, and staff.

by 2-inch cores. Moisture held at 15 atmospheres of tension was determined by using a pressure-membrane apparatus (*17*).

Organic carbon, reported in table 12, was determined by a modification of the Walkey-Black wet oxidation method (*10*).

Nitrogen was determined by the Kjeldahl method (*3*).

Calcium, magnesium, sodium, and potassium were determined in a neutral normal ammonium acetate soil extract (*10*). Extractable acidity (hydrogen) was determined by leaching with barium chloride solution buffered at pH 8.1 with triethanolamine (*9*). The cation exchange capacity (sum) is the total of extractable cations.

Soil reaction was determined with 1 : 1 soil-water ratio by glass electrode and pH meter on samples that had been air dried.

The percentage of free iron oxide was determined on a sodium dithionite extract (*7*).

The percentages of clay mineral were determined by Dr. L. J. Johnson, Agronomy Department, The Pennsylvania State University. X-ray diffraction traces were obtained from oriented clay samples by use of copper radiation, a Geiger counter, and a chart recorder. Air-dry soil samples were treated with hydrogen peroxide to destroy organic matter. Iron oxides were removed by treatment with oxalic acid, potassium oxalate, and magnesium ribbon (*6*). The clay (particles smaller than 0.002 millimeter) was separated with a centrifuge, one part saturated with potassium ions and one part saturated with magnesium ions. Suspensions of clay were placed on glass slides, allowed to air dry, and used to obtain diffraction traces. The magnesium-saturated slide was then solvated with ethylene glycol. The potassium-saturated slide was heated to 300° C. and 500° C. successively. Diffraction traces were obtained from each treatment. The traces were interpreted on the basis of peak height and relationship to known clay mixtures.

Summary of Data

Particle-size distribution.—The medium-textured to fine-textured Tyler, Purdy, and Wharton soils show a marked accumulation of clay in the subsoil because clay particles have moved from the surface layer into the subsoil. Because of this movement, the loss of the silty or loamy surface layer exposes the clayey, less manageable subsoil.

Evidence of clay translocation is little or none in the coarser textured Hazleton soil. The Chavies, also coarser textured, has more clay in the subsoil than in the surface layer. This fact is interpreted as evidence of clay movement in the soil, but it may be the result of stratification of the original sediments.

Coarse fragment content.—The Purdy, Tyler, and Chavies soils have vitrually no stones or coarse fragments above the depth where they are underlain by gravelly material. These soils can be expected to be free of stones because they developed from sediments sorted and deposited by water. Hazleton and Wharton soils developed in residuum from rock and have significant amounts of rock fragments that increase in occurrence and size as depth increases.

Bulk density.—Bulk density is expressed in grams per cubic centimeter and is given in table 12 for the soil mass, including pores, as it naturally occurs. A low bulk density is generally desirable for it indicates more pore space and better aeration unless the soil is waterlogged. The data in table 12 show an increase in bulk density as depth increased, and this increase roughly coincides with a decrease in biological activity. Bulk density generally approaches 2 grams per cubic centimeter or more as soil material grades into underlying geologic material.

Available moisture capacity.—The determination of moisture held at ⅓ atmosphere of tension is an approximation of the field soil moisture capacity, or the amount of water held against gravity after drainage through the soil has essentially stopped. The determination of moisture held at 15 atmospheres of tension is an approximation of the wilting point, which is the water content of a soil at which plants wilt and do not recover. An estimate of the capacity of the soil to store water available to plants can be obtained by subtracting the 15-atmosphere percentage from the ⅓-atmosphere percentage. Multiplication of this moisture percentage by the bulk density gives inches of moisture that can be stored per inch of soil.

Texture is the most important soil property affecting available moisture capacity in deep, well-drained soils. The surface layer of the Purdy, Tyler, and Wharton soils has a higher available water capacity than that of the Chavies and Hazleton soils. This is mainly because of the relatively high silt content of the Purdy, Tyler, and Wharton soils. Soil horizons that contain more sand, such as those of the Chavies or Hazleton soils, or subsoils that contain more clay, such as those of the Purdy, Tyler, and Wharton soils, generally store less available moisture. In fragipans and other compact soil layers, high bulk density accompanies reduced porosity and available water capacity. Large amounts of coarse fragments also limit capacity to store water. The available moisture data in table 11 may be deceiving for the Purdy soil because it is poorly drained and the water table rises into the root zone. For the same reason, care must be taken in applying the data in table 11 to Wharton and Tyler soils.

Organic carbon and nitrogen.—Percentages of carbon and nitrogen are highest in the surface layer of all soils. The percentage of organic carbon multiplied by two gives a rough estimate of the total content of organic matter. For example, the Ap horizon of the Hazleton soil contains about 4 percent organic matter by weight, and the rest is mineral material. The percentage of organic matter, by volume, is considerably more, perhaps 10 to 12 percent in the Ap horizon, since organic matter is much less dense than soil mineral material. Organic matter is mostly dark-colored humified material that benefits the structure and workability of the soil, the capacity for holding nutrients, and other properties. Organic-matter content decreases sharply from the surface layer to the subsoil in most soils.

Soil organic matter contains nitrogen that becomes available to plants only when released by microbial activity. The A horizon of the Hazleton soil shows the highest carbon-nitrogen ratio, and this indicates low natural fertility. The low carbon-nitrogen ratios in the subsoil are probably the result of ammonium nitrogen fixed in the soil minerals and are not related to the organic matter.

TABLE 11.—*Mechanical analyses and*

[Dashes in columns indicate sample

Soil series and sample number	Horizon	Depth from surface	Particle-size distribution				
			Very coarse sand (2.0 to 1.0 mm.)	Coarse sand (1.0 to 0.5 mm.)	Medium sand (0.5 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)
		Inches	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Chavies:							
S64Pa-26-3-1	Ap	0-9	0	0. 7	10. 9	30. 6	20. 8
S64Pa-26-3-2	B21	9-17	0	. 6	14. 1	31. 0	20. 2
S64Pa-26-3-3	B22t	17-23	0	. 5	10. 5	29. 4	14. 6
S64Pa-26-3-4	B23t	23-34	0	. 2	6. 1	22. 8	23. 6
S64Pa-26-3-5	B24	34-43	. 1	. 3	3. 4	17. 8	14. 3
S64Pa-26-3-6	B25	43-54	0	. 8	4. 7	12. 5	19. 7
S64Pa-26-3-7	B26	54-58	. 2	1. 5	9. 0	9. 2	10. 2
S64Pa-26-3-8	B3	58-70	. 1	2. 1	13. 2	21. 5	19. 7
S64Pa-26-3-9	C	70-72	1. 1	5. 2	20. 1	24. 3	17. 1
Hazleton:							
S64Pa-26-8-1	Ap	0-7	1. 1	1. 7	12. 5	29. 5	11. 7
S64Pa-26-8-2	A2	7-11	1. 0	1. 4	11. 2	30. 4	12. 7
S64Pa-26-8-3	B1	11-18	1. 4	1. 9	12. 5	35. 5	12. 6
S64Pa-26-8-4	B21	18-25	. 5	2. 0	12. 6	41. 5	17. 4
S64Pa-26-8-5	B22	25-31	. 6	3. 5	1. 8	43. 7	23. 6
S64Pa-26-8-6	C1	31-39	8. 1	6. 4	4. 9	23. 9	22. 7
S64Pa-26-8-7	C2	39-50	7. 2	3. 9	4. 4	21. 0	22. 7
S64Pa-26-8-8	C3	50-59	3. 2	3. 5	5. 5	25. 8	31. 8
Purdy:							
S64Pa-26-2-1	Ap	0-9	1. 2	1. 8	1. 9	3. 0	1. 9
S64Pa-26-2-2	A2g	9-13	. 8	3. 3	3. 2	3. 5	5. 6
S64Pa-26-2-3	B21tg	13-19	. 5	2. 0	2. 3	2. 4	3. 3
S64Pa-26-2-4	B22tg	19-25	. 1	. 6	1. 3	2. 0	4. 0
S64Pa-26-2-5	B23tg	25-32	. 1	. 3	. 9	1. 7	0
S64Pa-26-2-6	B24tg	32-40	. 1	. 4	2. 2	3. 0	6. 0
S64Pa-26-2-7	B25tg	40-50	0	. 7	3. 9	4. 2	6. 7
S64Pa-26-2-8	B3g	50-55	. 3	. 6	3. 5	4. 8	10. 5
Tyler:							
S64Pa-26-4-1	Ap	0-7	. 6	2. 0	3. 4	8. 8	10. 6
S64Pa-26-4-2	B1	7-10	. 7	1. 8	3. 6	8. 4	7. 0
S64Pa-26-4-3	B21t	10-13	1. 1	1. 7	4. 0	9. 3	10. 1
S64Pa-26-4-4	B22tg	13-18	1. 4	2. 0	4. 7	11. 4	11. 8
S64Pa-26-4-5	B23tg	18-25	1. 3	3. 3	5. 4	11. 6	12. 6
S64Pa-26-4-6	B24tg	25-31	. 9	2. 0	5. 7	14. 7	14. 7
S64Pa-26-4-7	Bx1g	31-36	3. 9	4. 1	6. 4	11. 7	11. 6
S64Pa-26-4-8	Bx2g	36-45	11. 0	16. 6	15. 7	14. 5	8. 1
S64Pa-26-4-9	Bx3g	45-54	11. 1	18. 2	20. 7	18. 3	7. 7
S64Pa-26-4-10	C	54-60	14. 8	20. 5	19. 4	13. 9	6. 2
Wharton:							
S64Pa-26-7-1	Ap	0-7	2. 4	3. 0	2. 9	4. 0	9. 9
S64Pa-26-7-2	B21t	7 13	1. 9	1. 9	2. 3	2. 5	4. 3
S64Pa-26-7-3	B22t	13-19	2. 3	2. 3	2. 1	2. 5	4. 4
S64Pa-26-7-4	B23t	19-25	4. 4	3. 5	2. 5	2. 3	2. 8
S64Pa-26-7-5	B24t	25-30	5. 0	4. 3	3. 4	3. 7	8. 1
S64Pa-26-7-6	B25t	30-36	3. 4	3. 3	2. 6	4. 0	11. 8
S64Pa-26-7-7	B26tg	36-42	1. 2	1. 7	1. 5	2. 6	5. 4
S64Pa-26-7-8	B27g	42-50	7. 1	5. 6	3. 9	4. 2	9. 9

physical properties of selected soils

not taken or material not present]

Particle-size distribution—Continued			Coarse fragments (larger than 2.0 mm.)	Textural class (based on laboratory data)	Bulk density	Moisture held at—		Available moisture capacity
Coarse silt (0.05 to 0.005 mm.)	Fine silt (0.005 to 0.002 mm.)	Clay (less than 0.002 mm.)				Tension of ⅓ atmosphere (core)	Tension of 15 atmospheres (fragmented)	
Percent	*Percent*	*Percent*	*Percent by weight*		*Grams per cc.*	*Percent*	*Percent*	*Inches per inch of soil*
22. 4	7. 2	7. 4	0. 2	Fine sandy loam	1. 40	15. 8	10. 0	0. 08
20. 6	3. 6	9. 9	0	Fine sandy loam	1. 49	12. 7	9. 1	. 05
27. 7	4. 0	13. 3	0	Fine sandy loam	1. 48	15. 2	8. 1	. 11
28. 3	4. 8	14. 2	0	Very fine sandy loam	1. 62	16. 2	7. 0	. 15
42. 2	7. 6	14. 3	0	Loam	1. 71	17. 7	11. 0	. 11
35. 2	9. 1	18. 0	. 4	Loam	1. 80	17. 9	9. 3	. 15
46. 9	7. 9	15. 1	. 2	Silt loam	1. 64	18. 1	11. 4	. 11
33. 3	1. 3	8. 8	0	Fine sandy loam	1. 69	17. 4	12. 1	. 09
25. 6	6. 2	. 4	29. 2	Fine sandy loam	----------	----------	----------	----------
22. 3	6. 0	15. 2	24. 6	Fine sandy loam	1. 24	19. 8	9. 6	. 13
21. 4	7. 5	14. 4	20. 8	Fine sandy loam	1. 26	17. 8	7. 7	. 13
17. 0	4. 7	14. 4	16. 7	Fine sandy loam	1. 35	15. 7	6. 4	. 13
10. 4	1. 9	13. 7	27. 0	Fine sandy loam	1. 58	10. 5	5. 7	. 08
11. 3	1. 7	13. 8	5. 2	Fine sandy loam	1. 48	14. 4	5. 8	. 13
11. 9	4. 2	17. 9	34. 6	Fine sandy loam	1. 65	9. 4	7. 2	. 04
15. 1	4. 8	20. 9	58. 5	Sandy clay loam	1. 64	14. 9	8. 8	. 10
13. 7	2. 8	13. 7	52. 9	Very fine sandy loam	1. 57	13. 5	5. 6	. 12
49. 6	13. 4	27. 2	0	Silty clay loam	1. 24	30. 8	9. 6	. 26
47. 8	10. 0	25. 8	2. 8	Silt loam	1. 48	23. 8	11. 4	. 18
50. 7	11. 4	27. 4	1. 5	Silty clay loam	1. 52	23. 3	12. 6	. 16
46. 3	8. 1	37. 6	0	Silty clay loam	1. 39	25. 6	7. 4	. 25
46. 9	8. 5	41. 6	4. 5	Silty clay	1. 48	27. 2	8. 7	. 27
44. 2	6. 8	37. 3	. 9	Silty clay loam	1. 58	22. 8	13. 8	. 14
45. 0	8. 4	31. 1	0	Silty clay loam	1. 87	----------	----------	----------
46. 5	11. 6	22. 2	0	Silt loam	1. 85	----------	----------	----------
52. 1	1. 2	21. 3	. 6	Silt loam	1. 23	24. 1	10. 8	. 16
52. 0	. 9	25. 6	2. 0	Silt loam	1. 40	23. 3	9. 0	. 20
39. 2	8. 6	26. 0	. 1	Loam	1. 38	23. 6	16. 3	. 10
38. 3	7. 1	23. 3	0	Loam	1. 42	23. 2	11. 7	. 16
36. 2	7. 5	22. 1	9. 6	Loam	1. 49	21. 7	13. 6	. 12
35. 2	7. 1	19. 7	1. 6	Loam	1. 61	18. 7	18. 0	. 01
30. 7	7. 6	24. 0	29. 4	Loam	1. 55	21. 9	17. 4	. 07
15. 0	4. 3	14. 8	45. 9	Coarse sandy loam	1. 64	16. 4	9. 8	. 11
9. 1	2. 7	12. 2	47. 5	Coarse sandy loam	1. 62	14. 2	8. 5	. 09
10. 7	2. 2	12. 3	61. 3	Coarse sandy loam	1. 76	13. 5	8. 4	. 09
35. 0	15. 9	26. 9	4. 7	Silt loam	1. 41	24. 6	14. 1	. 15
25. 3	13. 9	47. 9	4. 3	Clay	1. 45	24. 0	17. 2	. 10
24. 7	13. 2	48. 5	13. 0	Clay	1. 43	24. 7	19. 1	. 08
21. 3	15. 8	47. 4	18. 1	Clay	1. 56	22. 2	16. 6	. 09
24. 5	12. 1	38. 9	24. 0	Clay loam	1. 59	21. 1	13. 8	. 12
26. 9	11. 6	36. 4	20. 7	Clay loam	1. 79	14. 8	12. 2	. 05
38. 8	15. 8	33. 0	21. 6	Silty clay loam	1. 71	16. 7	12. 0	. 08
39. 6	7. 4	22. 3	61. 0	Loam	1. 88	10. 0	8. 6	. 03

TABLE 12.—*Chemical*

[Dashes in columns indicate sample

Soil series and sample number	Horizon	Depth from surface	Organic carbon	Nitrogen	Carbon-nitrogen ratio	Calcium-magnesium ratio	Extractable cations (milliequivalents per 100 grams of soil)				
							Calcium	Magnesium	Sodium	Potassium	Hydrogen
		Inches	*Percent*	*Percent*							
Chavies:											
S64Pa-26-3-1	Ap	0–9	0. 72	0. 12	6. 0	0. 5	0. 9	1. 9	0. 1	0. 2	17. 2
S64Pa-26-3-2	B21	9–17	. 37	. 03	12. 3	. 9	2. 3	2. 5	. 1	. 2	7. 8
S64Pa-26-3-3	B22t	17–23	. 32	. 03	10. 7	1. 4	3. 1	2. 2	. 1	. 2	6. 9
S64Pa-26-3-4	B23t	23–34	. 34	. 03	11. 3	2. 0	4. 1	2. 1	. 1	. 1	5. 6
S64Pa-26-3-5	B24	34–43	. 28	. 04	7. 0	2. 4	4. 8	2. 0	. 1	. 1	6. 4
S64Pa-26-3-6	B25	43–54	. 35	. 03	11. 7	2. 7	5. 6	2. 1	. 1	. 1	4. 6
S64Pa-26-3-7	B26	54–58	. 37	. 04	9. 3	3. 6	6. 9	1. 9	. 1	. 1	6. 2
S64Pa-26-3-8	B3	58–70	. 42	. 03	14. 0	2. 7	5. 4	2. 0	. 1	. 1	6. 8
S64Pa-26-3-9	C	70–72	. 45	. 03	15. 0	2. 2	4. 6	2. 1	. 1	. 2	4. 1
Hazleton:											
S64Pa-26-8-1	Ap	0–7	2. 09	. 12	17. 4	2. 2	4. 4	2. 0	. 3	. 3	8. 0
S64Pa-26-8-2	A2	7–11	. 74	. 05	14. 8	1. 0	2. 4	2. 4	. 3	. 2	6. 6
S64Pa-26-8-3	B1	11–18	. 27	. 03	9. 0	. 7	1. 4	2. 0	. 3	. 3	3. 0
S64Pa-26-8-4	B21	18–25	. 06	. 02	----------	----------	. 6	1. 8	. 3	. 2	3. 0
S64Pa-26-8-5	B22	25–31	. 06	--------	----------	----------	. 6	1. 7	. 3	. 2	4. 4
S64Pa-26-8-6	C1	31–39	. 07	--------	----------	----------	. 7	2. 2	. 3	. 2	3. 6
S64Pa-26-8-7	C2	39–50	. 10	--------	----------	----------	. 6	2. 3	. 3	. 2	4. 4
S64Pa-26-8-8	IIC3	50–59	. 08	--------	----------	----------	. 4	1. 8	. 3	. 2	5. 8
Purdy:											
S64Pa-26-2-1	Ap	0–9	2. 41	. 20	12. 1	2. 6	9. 8	3. 7	. 2	. 3	12. 6
S64Pa-26-2-2	A2g	9–13	. 50	. 07	7. 1	1. 9	5. 7	3. 0	. 1	. 2	9. 3
S64Pa-26-2-3	B21tg	13–19	. 38	. 05	7. 6	1. 0	2. 9	2. 9	. 1	. 1	13. 0
S64Pa-26-2-4	B22tg	19–25	. 24	. 05	----------	. 9	3. 3	3. 6	. 3	. 2	16. 4
S64Pa-26-2-5	B23tg	25–32	. 20	--------	----------	. 8	3. 5	4. 5	. 2	. 2	15. 8
S64Pa-26-2-6	B24tg	32–40	. 19	--------	----------	. 7	3. 4	4. 7	. 2	. 2	14. 7
S64Pa-26-2-7	B25tg	40–50	. 17	--------	----------	. 9	3. 8	4. 2	. 2	. 1	12. 4
S64Pa-26-2-8	B3g	50–55	. 20	--------	----------	. 6	2. 6	4. 2	. 1	. 1	13. 3
Tyler:											
S64Pa-26-4-1	Ap	0–7	1. 27	. 12	10. 6	3. 0	8. 0	2. 7	. 1	. 2	6. 5
S64Pa-26-4-2	B1	7–10	. 53	. 06	8. 8	1. 7	5. 3	3. 2	. 1	. 2	10. 2
S64Pa-26-4-3	B21t	10–13	. 37	. 05	7. 4	2. 7	5. 1	1. 9	. 1	. 1	12. 2
S64Pa-26-4-4	B22tg	13–18	. 34	. 05	6. 8	1. 7	4. 9	2. 9	. 3	. 2	13. 0
S64Pa-26-4-5	B23tg	18–25	. 17	. 03	5. 7	1. 2	3. 6	3. 1	. 3	. 2	10. 7
S64Pa-26-4-6	B24tg	25–31	. 21	. 04	5. 3	. 8	2. 7	3. 2	. 3	. 2	11. 0
S64Pa-26-4-7	Bx1g	31–36	. 20	. 03	6. 7	. 6	2. 2	3. 6	. 3	. 2	12. 2
S64Pa-26-4-8	Bx2g	36–45	. 27	. 04	6. 8	. 6	1. 9	3. 4	. 3	. 2	11. 9
S64Pa-26-4-9	Bx3g	45–54	. 41	. 03	13. 7	. 5	1. 4	3. 1	. 3	. 2	11. 3
S64Pa-26-4-10	C	54–60	. 40	. 03	13. 3	. 5	2. 1	3. 9	. 3	. 2	11. 6
Wharton:											
S64Pa-26-7-1	Ap	0–7	1. 62	. 16	10. 1	2. 4	8. 7	3. 6	. 3	. 4	3. 3
S64Pa-26-7-2	B21t	7–13	. 48	. 06	8. 0	1. 9	6. 3	3. 3	. 3	. 2	5. 8
S64Pa-26-7-3	B22t	13–19	. 37	. 05	7. 4	1. 3	3. 6	2. 7	. 3	. 2	11. 3
S64Pa-26-7-4	B23t	19–25	. 26	. 03	8. 7	1. 6	3. 7	2. 3	. 3	. 3	11. 0
S64Pa-26-7-5	B24t	25–30	. 13	--------	----------	. 9	2. 3	2. 6	. 3	. 3	10. 5
S64Pa-26-7-6	B25t	30–36	. 08	--------	----------	. 6	1. 4	2. 3	. 3	. 2	8. 3
S64Pa-26-7-7	B26tg	36–42	. 08	--------	----------	. 4	. 6	1. 7	. 3	. 2	6. 1
S64Pa-26-7-8	B27g	42–50	. 05	--------	----------	. 1	. 2	2. 0	. 3	. 2	7. 7

properties of selected soils

not taken or material not present]

Cation exchange capacity (sum)	Base saturation (sum)	Reaction (electro-metric) (1:1 water)	Free iron oxides (Fe_2O_3)	Mineral composition of clay fraction (relative percentage)					
				Kaolinite	Illite	Vermiculite	Chlorite	Montmorillonite	Interstratified
Meq./100 gms. soil	*Percent*	*pH*	*Percent*						
20. 3	15	4. 5	2. 3	40	20	25	--	--	15
12. 9	40	5. 2	2. 8	40	25	20	--	--	15
12. 5	45	5. 4	3. 3	40	35	15	--	--	10
12. 0	53	5. 6	3. 3	40	45	10	--	--	5
13. 4	52	5. 8	3. 4	35	45	5	--	--	15
12. 5	63	5. 8	3. 6	35	45	5	--	--	15
15. 2	59	5. 8	3. 7	30	45	10	--	--	15
14. 4	53	5. 7	3. 9	25	50	10	--	--	15
11. 1	64	5. 7	3. 8	30	50	--	--	--	20
15. 0	47	6. 0	1. 7	20	20	20	--	--	40
11. 9	45	6. 4	1. 6	20	25	25	--	--	30
7. 0	57	5. 5	1. 6	25	30	30	5	--	15
5. 9	49	4. 9	1. 4	20	50	20	--	5	5
7. 2	39	4. 9	1. 2	20	55	10	5	5	5
7. 0	49	4. 7	1. 9	20	70	5	--	--	5
7. 8	44	4. 7	3. 0	10	80	5	--	--	5
8. 5	32	4. 8	2. 0	15	75	5	--	--	5
26. 6	53	5. 3	1. 7	--	--	--	--	--	--
18. 3	49	5. 2	3. 0	30	40	10	--	--	20
19. 0	32	4. 6	2. 8	35	40	10	--	10	5
23. 8	31	4. 4	2. 4	25	40	15	--	10	10
24. 2	35	4. 4	2. 1	30	40	15	5	5	5
23. 2	37	4. 4	1. 4	30	40	10	5	5	10
20. 7	40	4. 4	. 9	30	40	10	--	--	20
20. 3	34	4. 5	. 4	25	45	10	5	--	15
17. 5	63	6. 3	2. 6	35	25	30	--	--	10
19. 0	46	5. 0	4. 4	30	35	20	--	5	10
19. 4	37	4. 8	5. 1	30	30	30	--	5	5
21. 3	39	4. 8	5. 3	35	35	20	--	5	5
17. 9	40	4. 6	4. 0	30	40	20	--	5	5
17. 4	37	4. 5	3. 0	30	45	10	--	5	10
18. 5	34	4. 5	5. 7	30	50	10	--	--	10
17. 7	33	4. 7	6. 5	30	50	10	--	--	10
16. 3	31	4. 8	7. 2	25	55	10	--	--	10
18. 1	36	4. 7	8. 9	25	60	5	--	--	10
16. 3	80	6. 6	4. 8	50	20	10	5	--	20
15. 9	64	5. 9	4. 9	45	30	10	5	--	10
18. 1	38	5. 0	5. 5	45	40	5	--	--	10
17. 6	38	5. 0	5. 1	45	40	5	5	--	5
16. 0	34	4. 9	6. 4	45	45	--	5	--	5
12. 5	34	4. 9	4. 4	45	45	--	--	--	10
8. 9	31	4. 8	2. 2	40	45	--	5	--	10
10. 4	26	4. 7	2. 5	40	45	--	--	--	15

Cation exchange properties.—Mineral and organic particles absorb positively charged ions (cations), including those of calcium, magnesium, sodium, and potassium, usually called bases, as well as acidic cations, such as those of aluminum or hydrogen. All these cations are held by the soil against leaching by water, but they may be displaced by other cations. Each soil has a particular capacity. The total of the extractable cations (bases and acidity) is regarded as the action exchange capacity of a soil sample. Base saturation is the percentage of the cation exchange capacity that is supplied by bases. This percentage is important as an index of fertility because the bases are plant nutrients and the acidic cations are not. If acidic cations are excessive, they cause low pH values and interfere with the availability of phosphorus. Also, the corrosion rates of some underground pipelines are increased if acidity is high.

Calcium and magnesium are the most plentiful bases in all these soils, and the calcium-magnesium ratio is favorable for plant growth in all surface layers except that of the Chavies soil, which contains more magnesium than calcium. Lime is used on these soils primarily to neutralize excess acidity, not to provide more calcium and magnesium. Cation exchange capacity is highest in the soils that are high in content of clay or of organic matter. Practically, this means that the Purdy, Tyler, Wharton, and similar soils require larger applications of lime or other amendments than do the Hazleton or Chavies soils, which have lower cation exchange capacity. If fertility is built up, however, it lasts longer in the soils that have high cation exchange capacity.

Soil reaction.—The pH values reflect the natural acidity of the soils except in the horizons that have been modified by liming and fertilizing. All but the Chavies profile appear to have been neutralized somewhat in the surface layer by liming.

Clay mineralogy.—All five soils are very similar in their clay mineralogy. The dominant minerals are kaolinite and illite, though illite normally is slightly more plentiful. Kaolinite generally is fairly constant as depth increases in each soil, but illite appears depleted in the surface horizons where apparently it has weathered to vermiculite or to inter-stratified illite-vermiculite-chlorite-montmorillonite combinations. Only the Purdy soil does not show this weathered profile, probably because poor drainage has slowed weathering. Other Purdy soils in the county do show some weathering of illite.

The clays in these soils have relatively low cation exchange capacity compared to that of soils containing more montmorillonite and vermiculite. Shrinking and swelling is slight in these soils because they contain small amounts of montmorillonite.

General Nature of the County

This section provides general information about the county. It describes industrial development and transportation, climate, farming, economic geology, and water.

Industrial Development and Transportation

The white man arrived in what is now Fayette County in about 1750, and the county was established in 1783.

The earliest important industry was distilling whiskey, and that was followed by producing iron. The first iron produced west of the Allegheny Mountains was in Fayette County, but the iron industry declined rapidly because the fuel used was wood converted to charcoal. The tremendous amount of wood required soon depleted the forests of the county. The coal and coke industry followed iron and reached its peak in 1909. Although this industry declined from 1909, it still was the major industry in the county until the 1950's. In the 1950's, manufacturing became the main industry, and its growth continues.

The use of nonfarmland in Fayette County has been affected mainly by topography and the location of mineral resources. About 90 percent of the people live in the nearly level western part of the county. Development in the mountainous eastern part is sparse. Communities have developed mainly along the rivers and along the transportation routes established in the early days.

In 1959, approximately 60,000 acres, or 12 percent of the county, was not farmland. Nonfarmland in rural areas amounts to about 25,000 acres and includes land that was used for coal and coke operations. Areas of this kind of land are west of Chestnut Ridge, where there are abandoned coke ovens and mine dumps. In the southwestern part of the county, stripmining has been fairly extensive.

Proposed industrial sites are in the north-central part of the county along State Route 51 and U.S. Highway No. 119. The selection of industrial sites is based primarily on topography and accessibility to transportation. Information on soil drainage and on soil characteristics that affect engineering is valuable in the selection of industrial sites.

The county is covered by a network of State highways and township roads. The primary State highway system has 197 miles of these highways. It includes U.S. Highway No. 40, one of the original highways between the eastern and western parts of the United States. Most other principal highways are north-south roads that provide easy access to Pittsburgh, the Pennsylvania Turnpike, and Morgantown, West Virginia.

Six railroads serve the county, and all provide freight service. Only one carries passengers.

Climate [7]

Fayette County has a humid, continental climate. Summers are warm, winters are cold, and precipitation normally is ample and well distributed throughout the year. Every few days prevailing westerly winds bring weather systems across the county that produce frequent and sometimes abrupt changes in the weather.

During winter and spring, the weather changes almost every day, though occasional periods of very cold weather may last for several days in December, January, and February. Winters usually are rigorous but not especially severe. Winter storms frequently bring widespread cloudiness and some form of precipitation. Winds from west to northwest may last for several days after a storm. In the lulls between storms, there is much freezing and thawing because the sun shines. Spring, usually the windiest sea-

[7] By Nelson M. Kauffman, State climatologist, National Weather Service, The Pennsylvania State University, University Park, Pennsylvania.

son, has spells of warm, sunny weather between colder periods. Storms move through the county in fairly rapid succession and sometimes bring several inches of snow as late as mid-April.

Because the general atmospheric circulation becomes more sluggish as summer approaches, fair, warm weather prevails for a week or more at a time. Then there is only an occasional thundershower in the afternoon or evening. One or more periods of hot weather usually occur in summer but nights are cool. Summer normally is the wettest season, and most rain falls in showers and thunderstorms. By mid-September nights begin to become chilly, but balmy days linger through much of October. Fall is the driest season, for the showers lessen considerably. An occasional hurricane or tropical storm, however, may considerably alter the rainfall pattern.

In Fayette County most of the climatic variations are caused by local topography. In the Chestnut Ridge and Laurel Hill areas, temperatures are lower and cloudiness and precipitation are greater than in the lower and less rugged areas of the central and western parts of the county. In these less rugged areas, variations are primarily the overnight minimum temperatures that usually are the result of local cold air drainage. In valley bottoms and other areas where air drainage is relatively poor, temperatures are lower and growing seasons are shorter than in surrounding higher areas.

Temperature and precipitation has been recorded at numerous places in Fayette County for a number of years. The longest and most complete records have been kept at Uniontown, and the data in tables 13 and 14 have been compiled from these records. Uniontown is at an elevation of 1,040 feet above sea level, and its climatic data are representative of all except the Chestnut Ridge and Laurel Hill areas of the county.

Temperature

Average annual temperature is about 54° F. in the area west of Chestnut Ridge, but it decreases approximately 4° at higher eastern elevations. This difference is normally maintained throughout the year. January, usually the coldest month, has average temperatures that range from 30° in the eastern part of the county to 34° in the western part. The average temperatures in July, the warmest month, range from 70° to 74°. Temperatures generally remain between 0° and 95° throughout the year, though extreme temperatures of −22° and of 102° have been recorded. At Uniontown temperatures dip to 0° on an average of 2 days per winter. They reach 90° on 23 days and 95° on one day during the warm season. A 100° temperature may be observed about once in 13 years.

The growing season, or the interval between the last 32° temperature in spring and the first in fall, normally extends from the end of April to mid-October, or about 169 days in most of the farming areas of the county. Freezing temperatures, however, have occurred as late as May 30 and as early as September 23. From 1931 to 1960, the growing season ranged from 122 to 205 days. Table 14 gives the probability that temperatures of 16° F., 20°, 24°, 28°, and 32°, or lower than any of these temperatures, will occur later than the dates listed for spring or earlier than those listed for fall. These data are representative of the western half of Fayette County.

Precipitation

Average annual precipitation ranges from 37 to 40 inches along the Monongahela River to 42 inches at the higher elevation of Chestnut Ridge and Laurel Hill. From 1931 to 1960, yearly totals have ranged from 30 to 71 inches. The precipitation usually is well distributed throughout the year. Amounts of 0.1 inch or more normally are recorded on 98 days per year. February usually is the driest month, and June the wettest month. From 1931 to 1960, monthly precipitation ranged from 0.1 inch to 15.6 inches. Short, dry spells may occur at any time, but extended droughts are rare.

TABLE 13.—*Temperature and precipitation at Uniontown*

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Average extreme maximum	Average extreme minimum	Average total	One year in 10 will have— Less than—	One year in 10 will have— More than—	Average monthly snowfall	Average number of days with snow cover 1.0 inch or more
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Inches	
January	43	25	65	4	3.2	1.3	5.2	7.2	8
February	44	25	65	5	2.5	1.3	4.0	6.3	6
March	52	31	75	13	3.8	1.8	6.3	5.4	3
April	65	41	84	24	3.7	2.0	5.6	.9	(1)
May	75	50	88	33	4.5	2.5	6.4	(2)	0
June	82	60	92	44	4.8	1.6	7.4	.0	0
July	85	63	94	50	4.2	2.2	6.4	.0	0
August	83	62	93	48	4.0	1.0	7.8	.0	0
September	78	55	91	38	3.0	1.3	5.7	.0	0
October	67	44	84	28	2.9	1.2	5.1	.1	0
November	54	35	76	16	2.7	1.1	4.2	2.9	1
December	44	27	65	5	2.8	1.3	4.6	5.9	7
Year	64	43	(3) 102	(4) 16	42.1	32.9	50.2	28.7	25

(1) Less than one-half day.
(2) Trace
(3) Highest maximum during 1931–60 period.
(4) Lowest minimum during 1931–60 period.

TABLE 14.—*Probabilities of last freezing temperature in spring and first in fall at Uniontown*

Probability	Dates of given probability at temperatures of—				
	16° F. or lower	20° F. or lower	24° F. or lower	28° F. or lower	32° F. or lower
Spring:					
1 year in 10 later than	March 29	April 7	April 21	April 29	May 14
2 years in 10 later than	March 22	March 31	April 14	April 25	May 9
5 years in 10 later than	March 9	March 19	April 2	April 17	April 29
Fall:					
1 year in 10 earlier than	November 19	November 9	October 27	October 11	October 1
2 years in 10 earlier than	November 23	November 14	November 1	October 17	October 6
5 years in 10 earlier than	December 1	November 23	November 11	October 28	October 15

About 52 percent of the annual precipitation occurs during the growing season, which may last from the first of May through mid-October. Most of this rainfall comes in afternoon showers and thunderstorms, which may be heavy but usually last less than 2 hours. Maximum amounts of 1.45 inches in 30 minutes, 2.21 inches in 1 hour, and 2.92 inches in 2 hours have been recorded in the county. Rainfall of 1.0 inch in 30 minutes can be expected about once every 2 years, but 1.9 inches in 1 hour can be expected only once in 10 years. Precipitation in fall, winter, and spring is more widespread, less intense, and of longer duration. This precipitation normally lasts from 6 to 24 hours or more. Daily amounts of precipitation that can be expected are 2.3 inches once a year and 3.4 inches once every 5 years.

Snowfall accounts for a considerable part of the precipitation from late in November through March. Because Fayette County is in the path of many winter storms, it is subject to snows that are frequently moderate and some times heavy. Average seasonal totals range from 25 inches near the Monongahela River to 29 inches in the west-central part of the county to nearly 70 inches in the eastern mountains. Year to year amounts of snow vary widely and range from less than 20 inches to more than 50 inches in the Uniontown area. Daily snowfall usually totals less than 6 inches in 24 hours, though 13 inches have been reported. The ground is covered with snow about 20 days in the western part of the county, 27 days in the central part, and 35 to 45 days on the eastern mountain ridges.

Farming

Unless otherwise specified, the figures in this subsection are from the U.S. Census of Agriculture. Largely because of economic changes, the number of farms has steadily declined. The U.S. Census of Agriculture indicates that the number of farms decreased from 2,546 in 1954 to 1,919 in 1959 and to 1,464 in 1964. Although the area in farms decreased from 197,752 acres in 1954 to 189,052 acres in 1959 and to 162,418 acres in 1964, the average size of farms increased from 77.7 acres in 1954 to 98.5 acres in 1959 and to 110.9 acres in 1964. Between 1954 and 1964, the acreage in cropland and pasture on farms decreased but the acreage in woodland increased.

Farmers are becoming increasingly aware of the need for conserving and improving their land. Demand increases for help in developing and carrying out farm programs that provide for proper land use and the conservation of the soil and water. The number of soil tests are increasing. These tests are to insure adequate fertility and good management that permit use of improved crop varieties

Table 15 lists the acreage of principal crops harvested in 1959 and 1964. Hay, corn, oats, and wheat have always been the principal crops in Fayette County, and they account for most of the area farmed. Generally, the acreage planted to crops has steadily decreased.

Table 16 lists the number of livestock and poultry in the county in 1959 and 1964. Livestock and livestock products, particularly dairy products, are more valuable in Fayette County than crops. Generally, the number of livestock decreased from 1959 to 1964, but the sale of milk or cream and poultry products increased from 1959 to 1964.

The principal nursery and greenhouse products grown in Fayette County are flowers and vegetable plants, trees, shrubs, cut flowers, potted plants, and the like.

Economic Geology

The geologic formations exposed in the county were formed during the Permian, Pennsylvania, Mississippian, and Devonian geological times (*5*). All except the De-

TABLE 15.—*Acreage of principal crops*

Principal crops	1959	1964
	Acres	*Acres*
Corn, for all purposes [1]	9,499	8,913
Harvested for grain	[1] 7,924	[1] 6,731
Cut for silage	[1] 1,390	[1] 2,067
Wheat	3,220	2,222
Oats	9,058	7,411
Barley	1,224	1,892
Alfalfa and alfalfa mixtures cut for hay	16,894	14,586
Clover, timothy, and mixtures of clover and grasses cut for hay	14,639	16,289
Other hay cut	1,254	1,032
Grass silage made from grasses, alfalfa, clover, or small grains	1,715	1,479
Total	57,703	53,824

[1] Not included in total.

TABLE 16.—*Number of livestock and poultry*

Livestock and poultry	1959	1964
Cattle and calves	25, 579	25, 155
Cows, including heifers that have calved	12, 700	12, 679
Milk cows	9, 359	8, 391
Heifers and heifer calves	8, 414	7, 933
Steers and bulls, including calves	4, 465	4, 543
Hogs and pigs	8, 662	4, 123
Chickens [1]	139, 510	112, 645
Sheep and lambs	1, 664	1, 859

[1] More than 4 months old.

vonian are carboniferous and formed when coal was forming. Also in the county are flood plains of recent and Pleistocene age, or less than a million years old. Old river channels and meanders occur in the uplands, 150 to 250 feet above the present river.

Fayette County lies in the Appalachian Plateau where the rocks have been pressed into open folds. In the eastern part of the county, the great open folds of the Allegheny Mountains are as much as 3,000 feet high. In the western part of the county, the folds of the Kanawha Plateau are not so high. The general trend of the folding is in a northeast-southwest direction.

Surface features and surface drainage have been influenced by the folding to some extent. To a greater extent, they are a result of the wearing down, or erosion, of these folds into a mature plateau.

Fayette County was rich in coal and gas, but deep mining has almost exhausted the supply of Pittsburgh coal. This mining was mostly in the southwestern part of the county. Where the coal was strip mined, scars that remain today were left on the landscape.

The gasfields in the Kanawha section are about exhausted, though some old gas wells are being reconditioned. New and deeper gas wells are drilled in the Kanawha area. Large gasfields have been found on Laurel Hill and Chestnut Ridge, though the wells drilled are much deeper than the older wells.

The Homewood and Connoquenessing sandstones were mined and quarried on the west slope of Chestnut Ridge, mostly above Connelisville and Dunbar. The Homewood sandstone is one of the purest sandstones and has been used in the making of high-quality glass, as has the Connoquenessing sandstone. Both of these sandstones also are suitable for uses as building blocks and silica refractories. Molding sands have been produced from the Carmichaels deposits and the Connoquenessing sandstone. Most of the sandstone in the county is used for crushed stone, natural stone base, building stone, and flagstone.

Sand from Connoquenessing sandstone is used in concrete and for blasting sands. Sandstone in Fayette County is abundant.

Limestone is a minor mineral resource of Fayette County. In the mountainous areas most of the limestone is the Loyalhanna and the Greenbriar. The Loyalhanna limestone is crushed into assorted sizes of gravel for roads and rock dust for use in mines. Most of the pulverized limestone, which is mostly used for liming, comes from the Greenbriar limestone, but it is blended with a higher grade limestone that is brought into the county.

The sand and gravel deposits of Fayette County are used to produce material for concrete aggregate and mortar. The sands of the Carmichaels deposits are some of the purest molding sands and glass sands.

Clay and shale in Fayette County are suitable for the manufacture of ceramic products. No clay products are now made from the Carmichaels clay, but it can be used in the manufacture of red face brick, drain tile, and fireproofing. Some of this clay can be used to make sewer pipe and paving brick, but probably the best use is for artistic pottery.

Shale and clay are plentiful in the county. The better shale is in the Allegheny and the Conemaugh groups and is suitable for making hollow tile. The poorer shale is in the Monongahela and the Permian groups and is suitable for making face brick.

The fire clays in the county are associated with coals of the lower Conemaugh group, the Allegheny and the Pottsville series. Fire clays used for refractories purposes are strip mined near Ohiopyle.

Water

Fayette County lies entirely within the watershed of the Monongahela River, but the Youghiogheny and Cheat Rivers are also main streams in the county. These three rivers play a large part in the everyday life of the county. The Monongahela River forms the western boundary of the county. It is navigable (with the help of 12 locks) for its entire 128.7 miles, from Fairmont, West Virginia, to Pittsburgh, where it joins the Allegheny to form the Ohio River. An estimated 25 million tons of freight move on the Monongahela River yearly. This river supplies water for all the communities on it in Fayette County except Point Marion, which obtains its supply from the Cheat River. Besides supplying water to Point Marion, the Cheat River supports boating and other water sports in the Cheat Lake area.

The Youghiogheny River supplies water to many communities along its route, including Uniontown, Connellsville, and Perryopolis. The Youghiogheny Reservoir helps to maintain this supply, and it is an integral part of the Ohio River flood control system. The reservoir also provides the area with excellent recreational facilities. The dam and the scenic falls downstream at Ohiopyle are notable tourist attractions.

Water supplies generally are sufficient for the people in the county. Where water shortages do occur, they are generally the result of inadequate distribution facilities. Where municipal water is not readily available, wells are drilled to obtain water. The failure of some springs and wells has resulted from subsistence caused by coal mining.

Among the stratigraphic units known to be sources of fresh water, the sandstones constitute the dominant source. The Homewood sandstone is probably the most consistent waterbearer. Limestone yields moderate amounts of well water. Salt water may be encountered in wells that are too deep.

A major problem in the county is pollution of streams by sewage and mine drainage. About 120 miles of the streams in the county are polluted. Pollution from mine

drainage is expected to lessen as mining operations continue to decrease.

Many people believe that the future of Fayette County depends on its ability to build up recreation and tourism. Potential lake sites that have possible surface areas of 20 acres or more are many. Present attractions in the county are Big Sandy Creek, Dunbar Creek, Indian Creek, Meadow Run, Bridgeport Dam, Community (Gorley's) Lake, Deer (Seaton's) Lake, Virgin Run Lake, Youghiogheny Reservoir, Back Creek, Mill Run, Beaver Creek, Buck Run, and the Monongahela, Youghiogheny, and Cheat Rivers. Some of these areas are the nucleus of new communities or a stimulus for expansion of existing communities. The continuing development of such areas can be a big factor in the economic growth of Fayette County.

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Glossary

Acidity. See Reaction, soil.

Aeration, soil. The process by which air and other gases in the soil are exchanged with air of the atmosphere. The rate of soil aeration depends largely on the size and number of the pores in the soil and on the amount of water in the pores. A soil that has many large pores is said to be well aerated.

Aggregate, soil. Many fine particles held in a single mass or cluster, such as a clod, crumb, block, or prism.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity (also termed available water capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Calcareous soil. A soil containing enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Channery soil. A soil that contains thin, flat fragments of sandstone, limestone, or schist, as much as 6 inches in length along the longer axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: Clay coat, clay skin.

Claypan. A compact, slowly permeable soil horizon that contains more clay than the horizons above and below it. A claypan is commonly hard when dry and plastic or stiff when wet.

Cobblestone. A rounded or partly rounded fragment of rock, 3 to 10 inches in diameter.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A mapping unit consisting of different kinds of soils that occur in such small individual areas or in such an intricate pattern that they cannot be shown separately on a publishable soil map.

Concretions. Hard grains, pellets, or nodules of various sizes, shapes, and colors consisting of concretions of compounds that cement the soil grains together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Conglomerate. Rock composed of gravel and rounded stones cemented together by hardened clay, lime, iron oxide, or silica.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderate resistance to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Contour farming. Plowing, cultivating, planting, and harvesting in rows that are at right angles to the natural direction of the slope or that are parallel to terrace grade.

Cover crop. A close-growing crop grown primarily to improve and to protect the soil between periods of regular crop production; or a crop grown between trees and vines in orchards and vineyards.

Depth, soil. In this survey soil depth refers to the depth to bedrock if the kind of limiting layer is not stated. Classes of soil depth are defined as follows:

Deep.—40 inches or more to solid bedrock.

Moderately deep.—20 to 40 inches to solid bedrock.

Shallow.—Less than 20 inches to solid bedrock.

Diversion. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and thus to protect areas downslope from the effects of such runoff.

Drainage, soil. The effect of soil characteristics that regulate the ease or rate of natural drainage. Five drainage classes are recognized in this county:

Well drained.—Excess water drains away rapidly and no mottling occurs within 36 inches of the surface.

Moderately well drained.—Water is removed from the soil rather slowly, and this results in short but significant periods of wetness. Mottling occurs between depths of 18 and 36 inches.

Somewhat poorly drained.—Water is removed slowly enough to keep the soil wet for significant periods but not all the time. Mottling occurs between depths of 8 and 18 inches.

Poorly drained.—Water is removed so slowly that the soil is wet for a large part of the time. Mottling occurs between the surface and a depth of 8 inches.

Very poorly drained.—Water is removed from the soil so slowly that the water table remains at or near the surface for the greater part of the time. In addition, ponding may occur at times. The soil has a black to gray surface layer that is mottled throughout.

Erosion. The wearing away of the land surface by wind, running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors, such as light, moisture, temperature, and the physical condition (or tilth) of the soil, are favorable.

Flood plain. Nearly level land, consisting of stream sediment, that borders a stream and is subject to flooding unless protected artificially.

Flooding. Water overtopping the natural banks of a creek, river, or other stream.

Fragipan. A dense, brittle subsurface horizon very low in organic matter and clay but rich in silt or very fine sand. The layer seems to be cemented when it is dry, is hard or very hard, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Graded stripcropping. Growing of crops in strips that are graded toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, and covered by grass for protection against erosion; used to conduct surface water away from cropland.

Gravelly soil material. From 15 to 50 percent of material, by volume, consists of rounded or angular rock fragments that are not prominently flattened and are up to 3 inches in diameter.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rains. The distinction between gully and rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by normal tillage, whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Heaving (of plants). The partial lifting of plants out of the ground, frequently with breaking of roots, that results from material freezing and thawing during winter.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. The A horizons make up a zone of eluviation, or leached zone. The B horizons make up a zone of illuviation, in which clay and other materials have accumulated. The A and B horizons, taken together, are called the solum, or true soil.

High water table. A zone of saturation in the soil that is within 6 inches of the surface most of the time. It can be the upper surface of the normal ground water, or it can be the upper surface of perched water that is separated from an underlying body of ground water by unsaturated material. A high water table is indicated by mottling within 8 inches of the soil surface. It is generally associated with soils that are poorly drained or very poorly drained.

Inclusion. An area of soil or other material mapped with a soil of a different mapping unit because it is too small to be mapped separately on a map of the scale used.

Internal soil drainage. That quality of a soil that permits the downward flow of excess water through it.

Lacustrine deposit (geology). Material deposited in lake water and exposed by lowering of the water level or elevation of the land.

Leached layer. A layer from which the soluble materials have been dissolved and washed away by percolating water.

Loam. Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Mapping unit, soil. An area of a soil, miscellaneous land type, soil complex, or undifferentiated soil group that is enclosed by a boundary on a soil map and identified by a symbol.

Morphology, soil. The makeup of the soil, including the texture, structure, consistence, color, and other physical, chemical, mineralogical, and biological properties of the various horizons that make up the soil profile.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils generally indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Parent material. The disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows:

Slow.—Less than 0.2 inch per hour.

Moderately slow.—0.20 to 0.63 inch per hour.

Moderate.—0.63 inch to 2.0 inches per hour.

Moderately rapid.—2.0 to 6.3 inches per hour.

Rapid.—More than 6.3 inches per hour.

Profile soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction, because it is neither acid nor alkaline. In words the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Residual material. Unconsolidated, partly weathered mineral material that accumulates over disintegrating solid rock. Residual material is not soil but is frequently the material in which a soil has formed.

Runoff. Water that flows off the surface of the soil without sinking in.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Seasonal high water table. A zone of saturation that is within 6 to 36 inches of the soil surface at least part of the year. It generally occurs in soils that are somewhat poorly drained or moderately well drained.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Solum (pl. sola). The upper part of the soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying parent material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips, or bands, to serve as vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are *platy* (laminated) *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Substratum. Any layer below the solum, or true soil; the C horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called *second bottoms*, as contrasted to *flood plains*, and are seldom subject to overflow.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. (See also clay, sand, and silt.) The basic textural classes, in order of increasing proportions of fine particles, are as follows: sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Weathering. All physical and chemical changes produced in rocks at or near the earth's surface by atmospheric agents. These changes result in more or less complete disintegration and decomposition of the rock.

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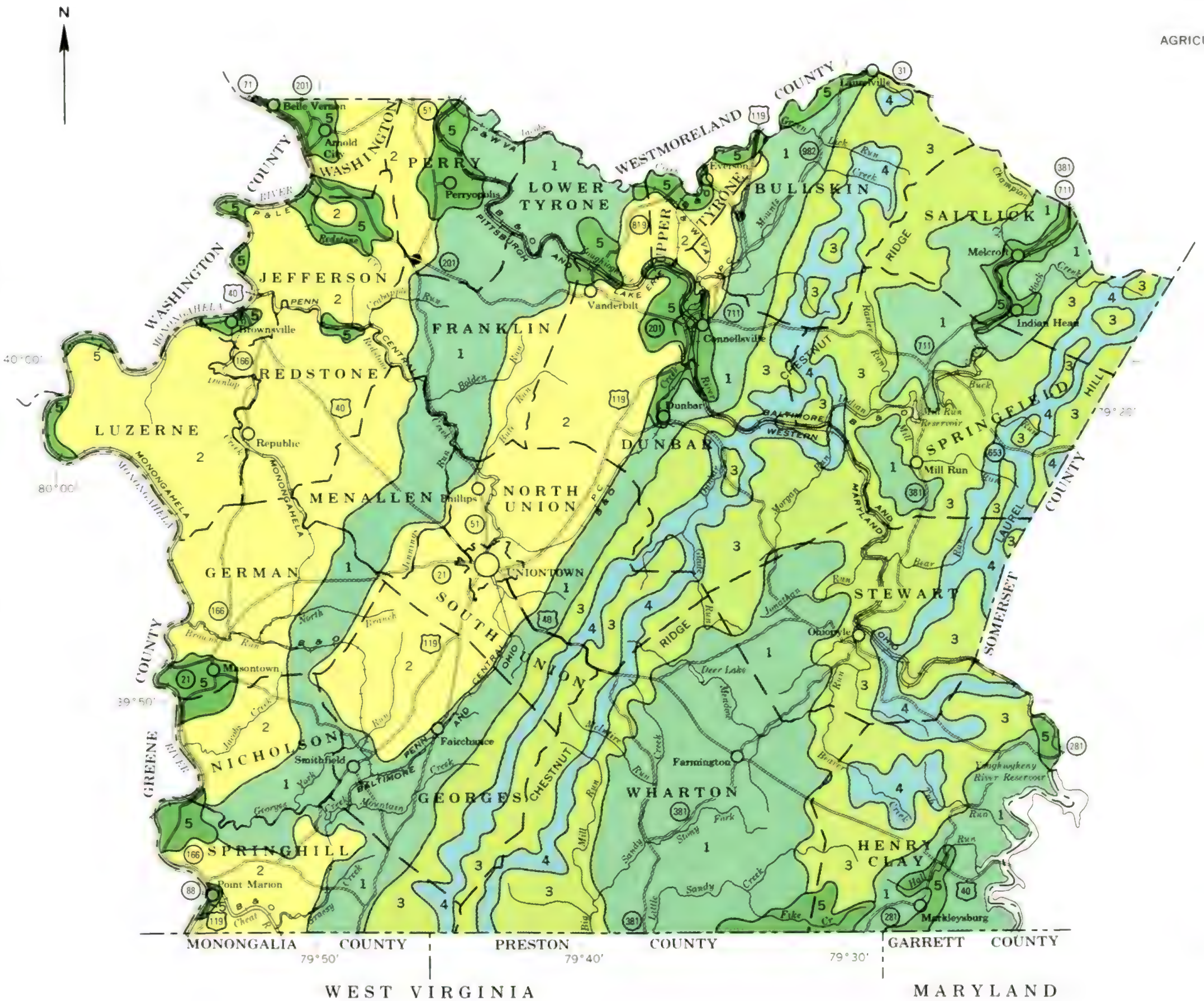
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PENNSYLVANIA STATE UNIVERSITY
AGRICULTURAL EXPERIMENT STATION AND AGRICULTURAL EXTENSION SERVICE
PENNSYLVANIA DEPARTMENT OF AGRICULTURE
STATE SOIL AND WATER CONSERVATION COMMISSION

GENERAL SOIL MAP

FAYETTE COUNTY, PENNSYLVANIA

Scale 1:253 440



SOIL ASSOCIATIONS *

1 Gilpin-Wharton-Ernest association: Moderately deep and deep, well drained and moderately well drained, medium-textured, nearly level to very steep soils underlain by acid shale and some sandstone bedrock; on uplands

2 Guernsey-Westmoreland-Clarksburg association: Deep, well-drained to somewhat poorly drained, medium-textured and moderately fine textured, nearly level to moderately steep soils influenced by limestone strata in the bedrock; on uplands

3 Dekalb-Hazleton-Cookport association: Moderately deep and deep, well drained and moderately well drained, moderately coarse textured and medium-textured, nearly level to very steep soils underlain by bedrock that is dominantly acid sandstone; on uplands

4 Upshur-Albrights association: Deep, well-drained to somewhat poorly drained, gently sloping to very steep, reddish soils; on uplands

5 Monongahela-Philo-Atkins association: Deep, moderately well drained and poorly drained, medium-textured, nearly level to sloping soils on stream terraces and flood plains

★ The terms for texture used in the descriptive heading of the association apply to the surface layer.

Published 1971

This map is for general planning. It shows only the major soils and does not contain sufficient detail for operational planning.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. In referring to a capability unit, read the introduction to the section it is in for general information about its management. Other information is given in tables as follows:

Predicted productivity of the soils, table 1, p. 13.
Soil interpretation for woodland, table 2, p. 18.
Suitability of soils for wildlife habitat and for kinds of wildlife, table 3, p. 23.
Engineering uses of the soils, tables 4, 5, and 6, pp. 26 through 43.

Estimated degree and kinds of soil limitations for town and country planning, table 7, p. 46.
Estimated degree and kinds of soil limitations that affect the use of soils for recreation, table 8, p. 54.
Approximate acreage and proportionate extent of the soils, table 9, p. 64.

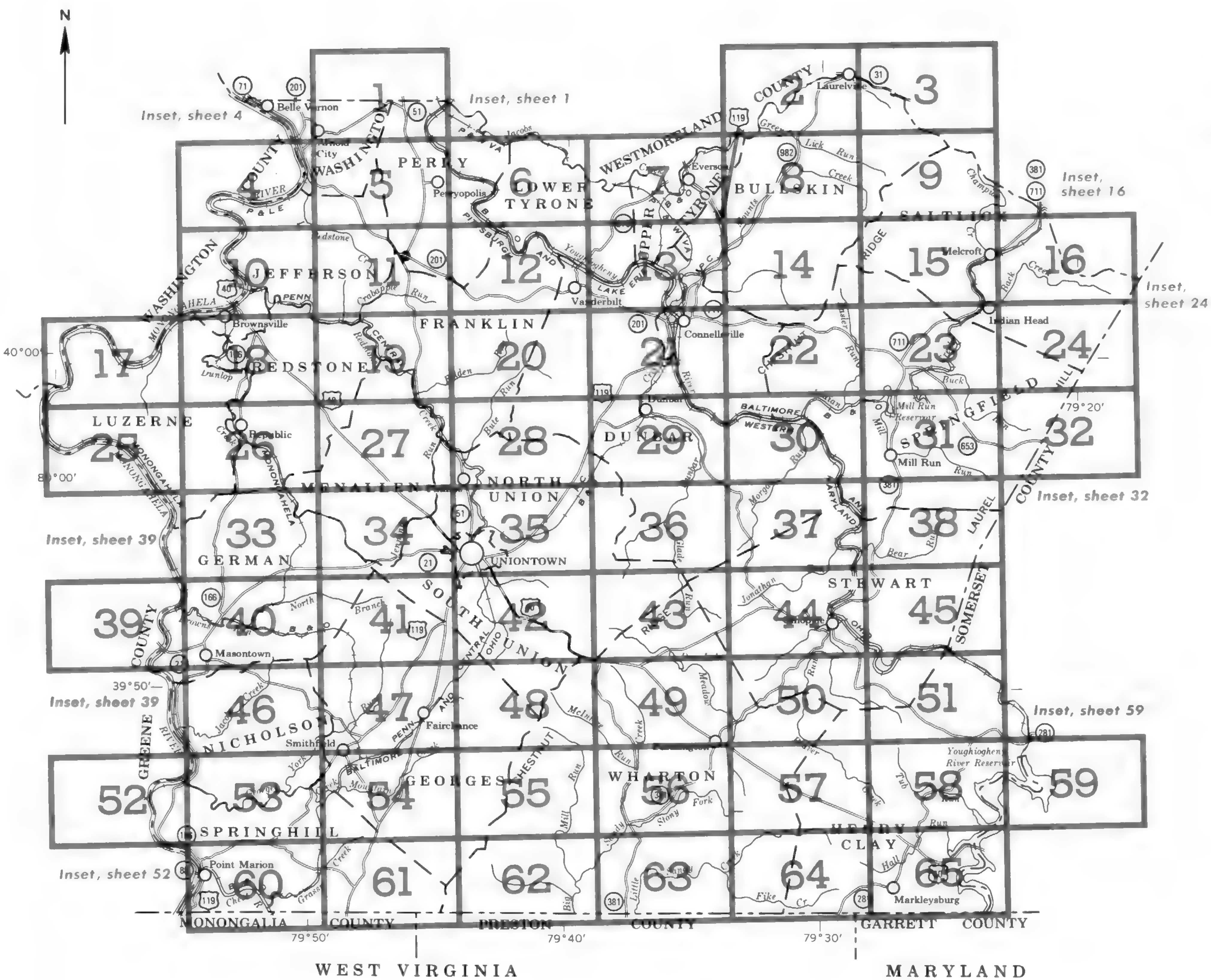
Map symbol	Mapping unit	Described on page	Capability unit	
			Symbol	Page
AbB2	Albrights silt loam, 3 to 8 percent slopes, moderately eroded	65	IIe-2	9
AcB	Albrights very stony silt loam, 0 to 8 percent slopes	65	VIs-2	11
AlB2	Allegheny fine sandy loam, 3 to 8 percent slopes, moderately eroded	66	IIe-1	8
AlC2	Allegheny fine sandy loam, 8 to 15 percent slopes, moderately eroded	66	IIIe-1	9
AnB	Andover very stony loam, 0 to 8 percent slopes	66	VIIs-1	11
At	Atkins silt loam	68	IIIw-1	10
BaA	Brinkerton and Armagh silt loams, 0 to 3 percent slopes	68	IVw-1	11
BaB	Brinkerton and Armagh silt loams, 3 to 8 percent slopes	68	IVw-1	11
BrB2	Brooke silty clay loam, 3 to 8 percent slopes, moderately eroded	69	IIIe-2	9
BrC2	Brooke silty clay loam, 8 to 15 percent slopes, moderately eroded	69	IVe-3	10
BrD2	Brooke silty clay loam, 15 to 25 percent slopes, moderately eroded	69	VIe-2	11
BuB	Buchanan very stony loam, 0 to 8 percent slopes	70	VIs-2	11
BuD	Buchanan very stony loam, 8 to 25 percent slopes	70	VIs-2	11
CaB2	Cavode silt loam, 3 to 8 percent slopes, moderately eroded	71	IIIw-2	10
CaC2	Cavode silt loam, 8 to 15 percent slopes, moderately eroded	71	IIIe-3	9
CaD2	Cavode silt loam, 15 to 25 percent slopes, moderately eroded	71	IVe-2	10
CdB	Cavode very stony silt loam, 0 to 8 percent slopes	71	VIs-2	11
CdD	Cavode very stony silt loam, 8 to 25 percent slopes	71	VIs-2	11
Ce	Chavies fine sandy loam	72	I-1	8
CgB	Clarksburg-Guernsey silt loams, 2 to 8 percent slopes	72	IIe-2	9
CgC2	Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded	72	IIIe-3	9
CgD2	Clarksburg-Guernsey silt loams, 15 to 25 percent slopes, moderately eroded	73	IVe-2	10
ClB2	Clymer channery loam, 3 to 12 percent slopes, moderately eroded	73	IIe-1	8
ClC2	Clymer channery loam, 12 to 20 percent slopes, moderately eroded	73	IIIe-1	9
CmB	Clymer very stony loam, 0 to 12 percent slopes	73	VIs-1	11
CmD	Clymer very stony loam, 12 to 30 percent slopes	73	VIs-1	11
CoA	Cookport loam, 0 to 3 percent slopes	74	IIw-2	9
CoB2	Cookport loam, 3 to 8 percent slopes, moderately eroded	74	IIe-2	9
CoC2	Cookport loam, 8 to 15 percent slopes, moderately eroded	74	IIIe-3	9
CpB	Cookport very stony loam, 0 to 8 percent slopes	74	VIs-2	11
CpD	Cookport very stony loam, 8 to 25 percent slopes	75	VIs-2	11
DaF	Dekalb channery loam, 30 to 60 percent slopes	75	VIIe-1	11
DbB	Dekalb very stony sandy loam, 0 to 12 percent slopes	75	VIs-1	11
DbD	Dekalb very stony sandy loam, 12 to 30 percent slopes	75	VIs-1	11
DbF	Dekalb very stony sandy loam, 30 to 80 percent slopes	75	VIIs-2	11
Ek	Elkins silt loam	76	IVw-2	11
ErA	Ernest silt loam, 0 to 3 percent slopes	77	IIw-2	9
ErB2	Ernest silt loam, 3 to 8 percent slopes, moderately eroded	77	IIe-2	9
ErC2	Ernest silt loam, 8 to 15 percent slopes, moderately eroded	77	IIIe-3	9
EsB	Ernest very stony silt loam, 0 to 8 percent slopes	77	VIs-2	11
EsD	Ernest very stony silt loam, 8 to 25 percent slopes	77	VIs-2	11
GcA	Gilpin channery silt loam, 0 to 3 percent slopes	78	IIs-1	9
GcB2	Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded	78	IIe-3	9
GcC2	Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded	78	IIIe-4	10
GcD2	Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded	78	IVe-4	11
GnB	Gilpin very stony silt loam, 0 to 12 percent slopes	78	VIs-1	11
GnD	Gilpin very stony silt loam, 12 to 30 percent slopes	78	VIs-1	11
GnF	Gilpin very stony silt loam, 30 to 60 percent slopes	78	VIIs-2	11
GrF	Gilpin-Weikert channery silt loams, 30 to 60 percent slopes	78	VIIe-1	11
GsB2	Guernsey silt loam, 3 to 8 percent slopes, moderately eroded	79	IIe-2	9
GsC2	Guernsey silt loam, 8 to 15 percent slopes, moderately eroded	79	IIIe-3	9
GsD2	Guernsey silt loam, 15 to 25 percent slopes, moderately eroded	79	IVe-2	10
GsE2	Guernsey silt loam, 25 to 35 percent slopes, moderately eroded	80	VIe-1	11
GtC3	Guernsey silty clay loam, 8 to 15 percent slopes, severely eroded	80	IVe-2	10
GtD3	Guernsey silty clay loam, 15 to 25 percent slopes, severely eroded	80	VIe-1	11
HaA	Hazleton channery loam, 0 to 3 percent slopes	81	I-1	8
HaB2	Hazleton channery loam, 3 to 12 percent slopes, moderately eroded	81	IIe-1	8
HaC2	Hazleton channery loam, 12 to 20 percent slopes, moderately eroded	81	IIIe-1	9
HaD2	Hazleton channery loam, 20 to 30 percent slopes, moderately eroded	81	IVe-1	10
LbB2	Library silty clay loam, 2 to 8 percent slopes, moderately eroded	82	IIIw-2	10
Ln	Lindside silt loam	82	IIw-1	9
Mc	Melvin and Newark silt loams	83	IIIw-1	10
Md	Mine dumps	83	VIIIs-1	12
MoA	Monongahela silt loam, 0 to 3 percent slopes	84	IIw-2	9
MoB2	Monongahela silt loam, 3 to 8 percent slopes, moderately eroded	84	IIe-2	9
MoC2	Monongahela silt loam, 8 to 15 percent slopes, moderately eroded	84	IIIe-3	9
Ph	Philo silt loam	85	IIw-1	9
Pu	Purdy silt loam	86	IVw-1	11
Ru	Rubble land	86	VIIIs-1	12
SmB	Strip mine spoil, acid, undulating	86	(1/)	--
SmD	Strip mine spoil, acid, rolling	86	(1/)	--
SmF	Strip mine spoil, acid, steep	86	(1/)	--
SnB	Strip mine spoil, nonacid, undulating	86	(1/)	--
SnD	Strip mine spoil, nonacid, rolling	87	(1/)	--
SnF	Strip mine spoil, nonacid, steep	87	(1/)	--
ThA	Thorndale silt loam, 0 to 3 percent slopes	87	IVw-1	11
ThB2	Thorndale silt loam, 3 to 8 percent slopes, moderately eroded	87	IVw-1	11
Ty	Tyler silt loam	88	IIIw-2	10
UhB2	Upshur silt loam, 3 to 8 percent slopes, moderately eroded	89	IIIe-2	9
UhC2	Upshur silt loam, 8 to 15 percent slopes, moderately eroded	89	IVe-3	10
UhD2	Upshur silt loam, 15 to 25 percent slopes, moderately eroded	89	VIe-2	11
UpB	Upshur very stony silt loam, 0 to 8 percent slopes	89	VIs-1	11
UpD	Upshur very stony silt loam, 8 to 25 percent slopes	90	VIs-1	11
UpF	Upshur very stony silt loam, 25 to 50 percent slopes	90	VIIs-2	11
UrB	Urban land, undulating	90	(1/)	--
UrD	Urban land, rolling	90	(1/)	--
WcA	Westmoreland channery silt loam, 0 to 3 percent slopes	91	I-1	8
WcB	Westmoreland channery silt loam, 3 to 12 percent slopes	91	IIe-1	8
WcC2	Westmoreland channery silt loam, 12 to 20 percent slopes, moderately eroded	91	IIIe-1	9
WcD2	Westmoreland channery silt loam, 20 to 30 percent slopes, moderately eroded	91	IVe-1	10
WrA	Wharton silt loam, 0 to 3 percent slopes	92	IIw-2	9
WrB2	Wharton silt loam, 3 to 8 percent slopes, moderately eroded	92	IIe-2	9
WrC2	Wharton silt loam, 8 to 15 percent slopes, moderately eroded	92	IIIe-3	9
WrD2	Wharton silt loam, 15 to 25 percent slopes, moderately eroded	93	IVe-2	10
WrE2	Wharton silt loam, 25 to 35 percent slopes, moderately eroded	93	VIe-1	11
WsB	Wharton very stony silt loam, 0 to 8 percent slopes	93	VIs-2	11
WsE	Wharton very stony silt loam, 8 to 30 percent slopes	93	VIs-2	11

1/ Capability unit not assigned.

INDEX TO MAP SHEETS
FAYETTE COUNTY, PENNSYLVANIA

Scale 1:253 440

1 0 1 2 3 4 Miles



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FAYETTE COUNTY, PENNSYLVANIA

PENNSYLVANIA STATE UNIVERSITY
AGRICULTURAL EXPERIMENT STATION
AGRICULTURAL EXTENSION SERVICE
PENNSYLVANIA DEPARTMENT OF AGRICULTURE
STATE SOIL AND WATER CONSERVATION COMMISSION

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Most symbols without a slope letter are those of nearly level soils, but some are for land types that have a considerable range of slope. A final number, 2 or 3, in the symbol shows that the soil is moderately eroded or severely eroded.

SYMBOL	NAME
AbB2	Albrights silt loam, 3 to 8 percent slopes, moderately eroded
AcB	Albrights very stony silt loam, 0 to 8 percent slopes
AlB2	Allegheny fine sandy loam, 3 to 8 percent slopes, moderately eroded
AlC2	Allegheny fine sandy loam, 8 to 15 percent slopes, moderately eroded
AnB	Andover very stony loam, 0 to 8 percent slopes
At	Atkins silt loam
BaA	Brinkerton and Armagh silt loams, 0 to 3 percent slopes
BaB	Brinkerton and Armagh silt loams, 3 to 8 percent slopes
BrB2	Brooke silty clay loam, 3 to 8 percent slopes, moderately eroded
BrC2	Brooke silty clay loam, 8 to 15 percent slopes, moderately eroded
BrD2	Brooke silty clay loam, 15 to 25 percent slopes, moderately eroded
BuB	Buchanan very stony loam, 0 to 8 percent slopes
BuD	Buchanan very stony loam, 8 to 25 percent slopes
CaB2	Cavode silt loam, 3 to 8 percent slopes, moderately eroded
CaC2	Cavode silt loam, 8 to 15 percent slopes, moderately eroded
CaD2	Cavode silt loam, 15 to 25 percent slopes, moderately eroded
CdB	Cavode very stony silt loam, 0 to 8 percent slopes
CdD	Cavode very stony silt loam, 8 to 25 percent slopes
Ce	Chavies fine sandy loam
CgB	Clarksburg-Guernsey silt loams, 2 to 8 percent slopes
CgC2	Clarksburg-Guernsey silt loams, 8 to 15 percent slopes, moderately eroded
CgD2	Clarksburg-Guernsey silt loams, 15 to 25 percent slopes, moderately eroded
ClB2	Clymer channery loam, 3 to 12 percent slopes, moderately eroded
ClC2	Clymer channery loam, 12 to 20 percent slopes, moderately eroded
CmB	Clymer very stony loam, 0 to 12 percent slopes
CmD	Clymer very stony loam, 12 to 30 percent slopes
CoA	Cookport loam, 0 to 3 percent slopes
CoB2	Cookport loam, 3 to 8 percent slopes, moderately eroded
CoC2	Cookport loam, 8 to 15 percent slopes, moderately eroded
CpB	Cookport very stony loam, 0 to 8 percent slopes
CpD	Cookport very stony loam, 8 to 25 percent slopes
DaF	Dekalb channery loam, 30 to 60 percent slopes
DbB	Dekalb very stony sandy loam, 0 to 12 percent slopes
DbD	Dekalb very stony sandy loam, 12 to 30 percent slopes
DbF	Dekalb very stony sandy loam, 30 to 80 percent slopes
Ek	Elkins silt loam
ErA	Ernest silt loam, 0 to 3 percent slopes
ErB2	Ernest silt loam, 3 to 8 percent slopes, moderately eroded
ErC2	Ernest silt loam, 8 to 15 percent slopes, moderately eroded
EsB	Ernest very stony silt loam, 0 to 8 percent slopes
EsD	Ernest very stony silt loam, 8 to 25 percent slopes
GcA	Gilpin channery silt loam, 0 to 3 percent slopes
GcB2	Gilpin channery silt loam, 3 to 12 percent slopes, moderately eroded
GcC2	Gilpin channery silt loam, 12 to 20 percent slopes, moderately eroded
GcD2	Gilpin channery silt loam, 20 to 30 percent slopes, moderately eroded
GnB	Gilpin very stony silt loam, 0 to 12 percent slopes
GnD	Gilpin very stony silt loam, 12 to 30 percent slopes
GnF	Gilpin very stony silt loam, 30 to 60 percent slopes
GrF	Gilpin-Weikert channery silt loams, 30 to 60 percent slopes
GsB2	Guernsey silt loam, 3 to 8 percent slopes, moderately eroded
GsC2	Guernsey silt loam, 8 to 15 percent slopes, moderately eroded
GsD2	Guernsey silt loam, 15 to 25 percent slopes, moderately eroded
GsE2	Guernsey silt loam, 25 to 35 percent slopes, moderately eroded
GtC3	Guernsey silty clay loam, 8 to 15 percent slopes, severely eroded
GtD3	Guernsey silty clay loam, 15 to 25 percent slopes, severely eroded
HaA	Hazleton channery loam, 0 to 3 percent slopes
HaB2	Hazleton channery loam, 3 to 12 percent slopes, moderately eroded
HaC2	Hazleton channery loam, 12 to 20 percent slopes, moderately eroded
HaD2	Hazleton channery loam, 20 to 30 percent slopes, moderately eroded
LbB2	Library silty clay loam, 2 to 8 percent slopes, moderately eroded
Ln	Lindside silt loam
Mc	Melvin and Newark silt loams
Md	Mine dumps
MoA	Monongahela silt loam, 0 to 3 percent slopes
MoB2	Monongahela silt loam, 3 to 8 percent slopes, moderately eroded
MoC2	Monongahela silt loam, 8 to 15 percent slopes, moderately eroded
Ph	Philo silt loam
Pu	Purdy silt loam
Ru	Rubble land
SmB	Strip mine spoil, acid, undulating
SmD	Strip mine spoil, acid, rolling
SmF	Strip mine spoil, acid, steep
SnB	Strip mine spoil, nonacid, undulating
SnD	Strip mine spoil, nonacid, rolling
SnF	Strip mine spoil, nonacid, steep
ThA	Thorndale silt loam, 0 to 3 percent slopes
ThB2	Thorndale silt loam, 3 to 8 percent slopes, moderately eroded
Ty	Tyler silt loam
UhB2	Upshur silt loam, 3 to 8 percent slopes, moderately eroded
UhC2	Upshur silt loam, 8 to 15 percent slopes, moderately eroded
UhD2	Upshur silt loam, 15 to 25 percent slopes, moderately eroded
UpB	Upshur very stony silt loam, 0 to 8 percent slopes
UpD	Upshur very stony silt loam, 8 to 25 percent slopes
UpF	Upshur very stony silt loam, 25 to 50 percent slopes
UrB	Urban land, undulating
UrD	Urban land, rolling
WcA	Westmoreland channery silt loam, 0 to 3 percent slopes
WcB	Westmoreland channery silt loam, 3 to 12 percent slopes
WcC2	Westmoreland channery silt loam, 12 to 20 percent slopes, moderately eroded
WcD2	Westmoreland channery silt loam, 20 to 30 percent slopes, moderately eroded
WrA	Wharton silt loam, 0 to 3 percent slopes
WrB2	Wharton silt loam, 3 to 8 percent slopes, moderately eroded
WrC2	Wharton silt loam, 8 to 15 percent slopes, moderately eroded
WrD2	Wharton silt loam, 15 to 25 percent slopes, moderately eroded
WrE2	Wharton silt loam, 25 to 35 percent slopes, moderately eroded
WsB	Wharton very stony silt loam, 0 to 8 percent slopes
WsE	Wharton very stony silt loam, 8 to 30 percent slopes

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Tunnel

Buildings
- School
- Church

Mine and quarry

Gravel pit

Power line

Pipe line

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
- Unclassified

Canals and ditches (CANAL)

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

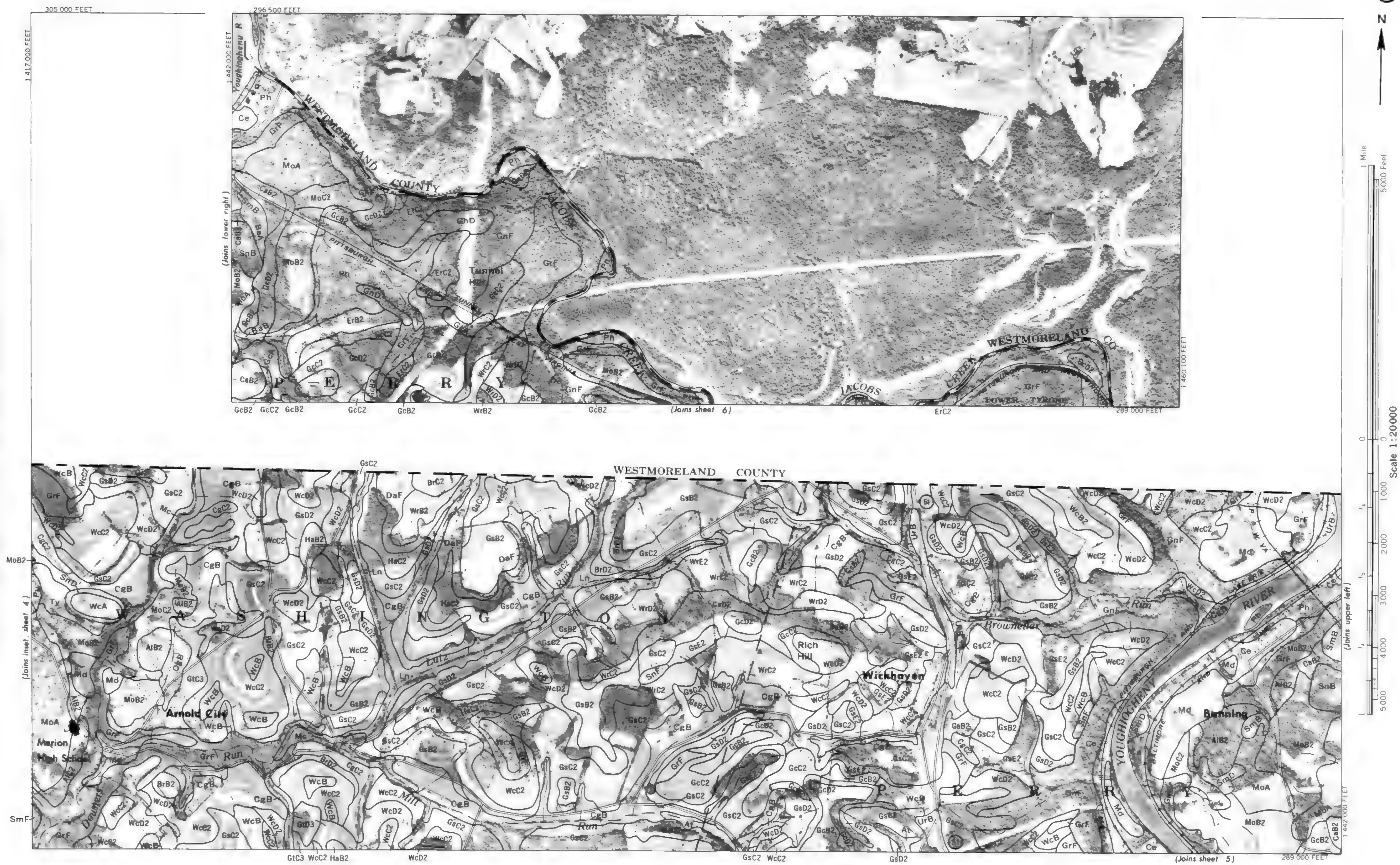
Drainage end

RELIEF

Escarpments

SOIL SURVEY DATA

- Soil boundary (Dx)
- Gravel
- Stoniness: Stony; Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully



FAYETTE COUNTY, PENNSYLVANIA NO. 1

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

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FAYETTE COUNTY, PENNSYLVANIA NO. 2

3

N

FAYETTE COUNTY, PENNSYLVANIA NO. 3

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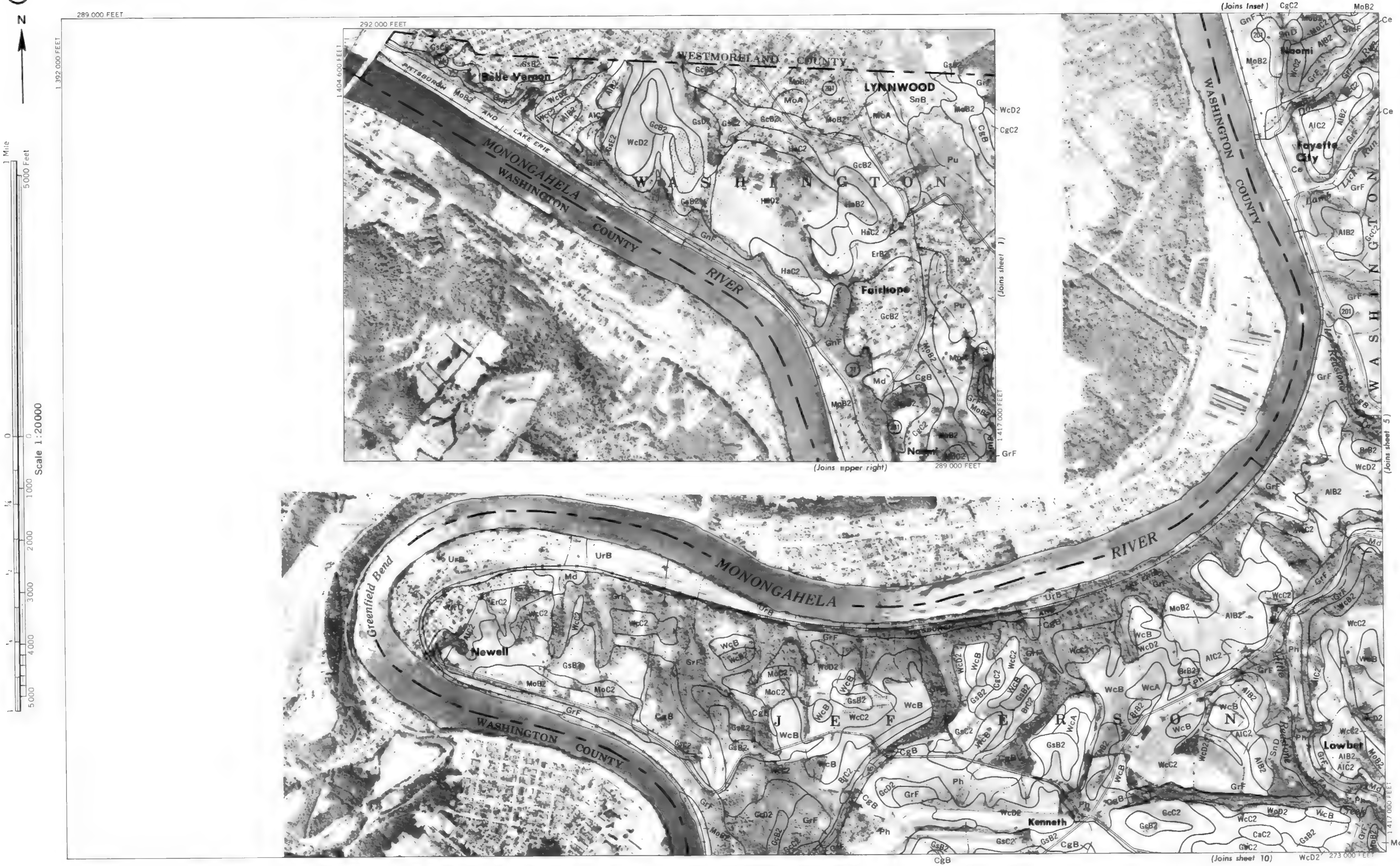
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
Scale 1:20000



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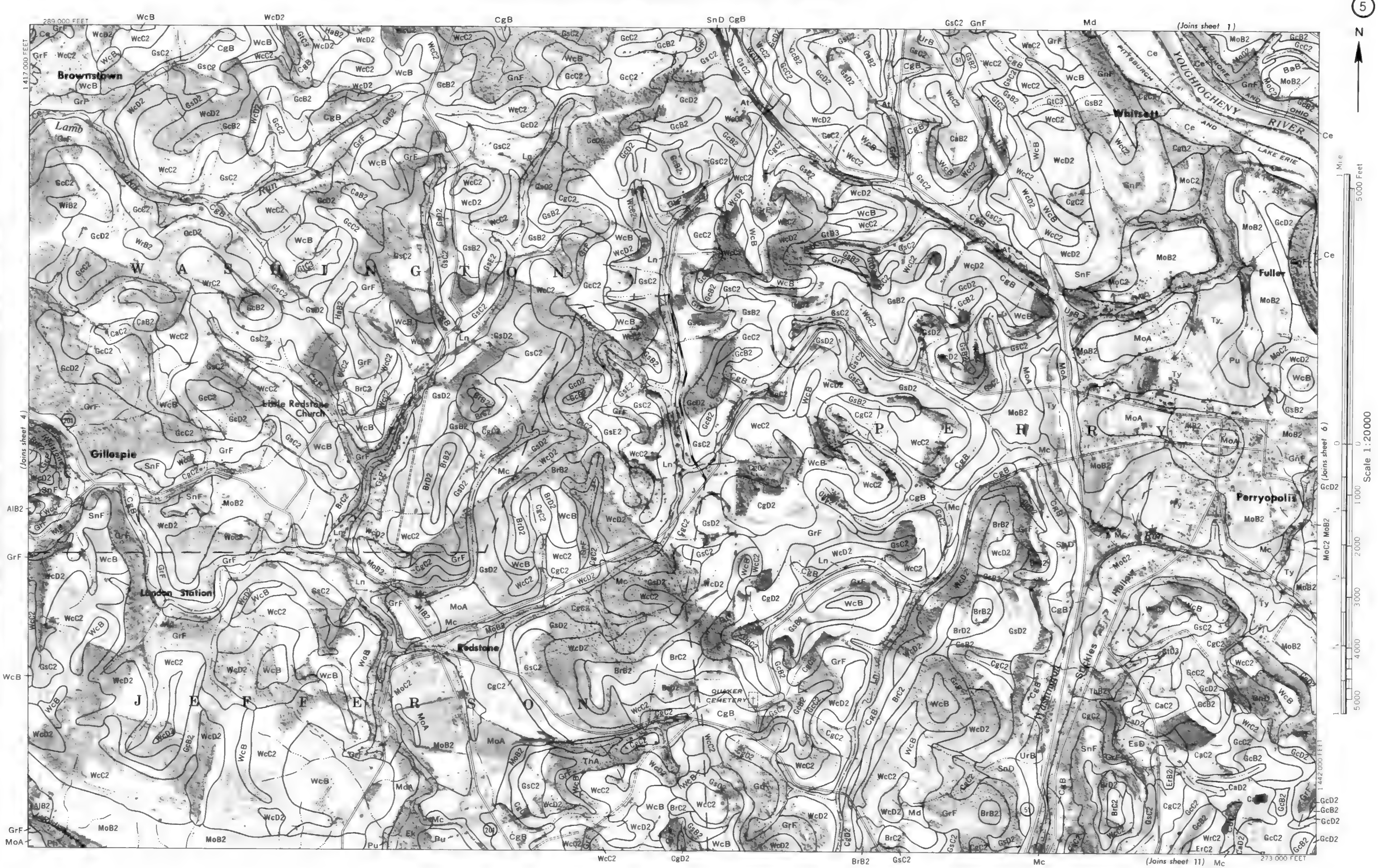

FAYETTE COUNTY, PENNSYLVANIA NO. 5

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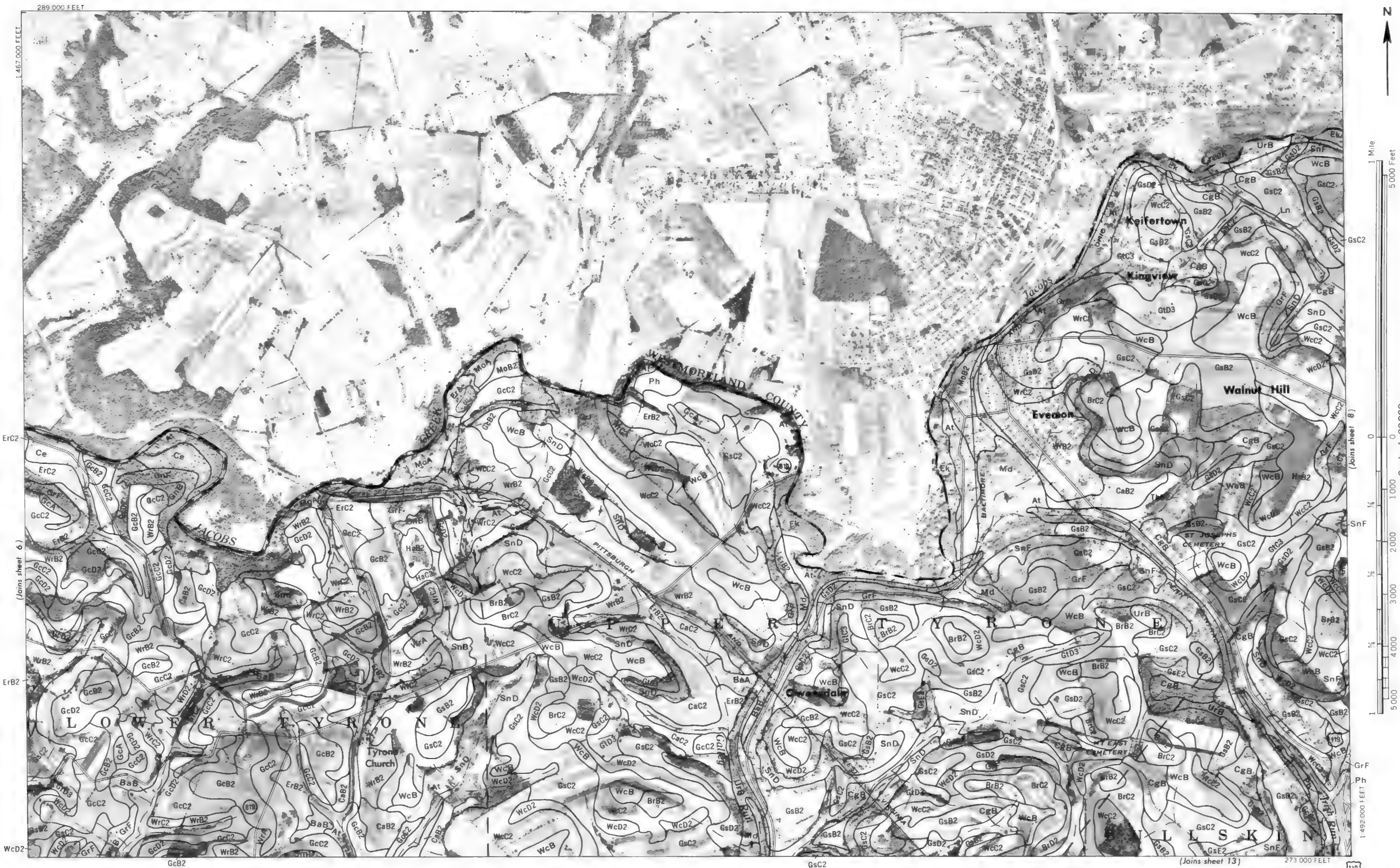

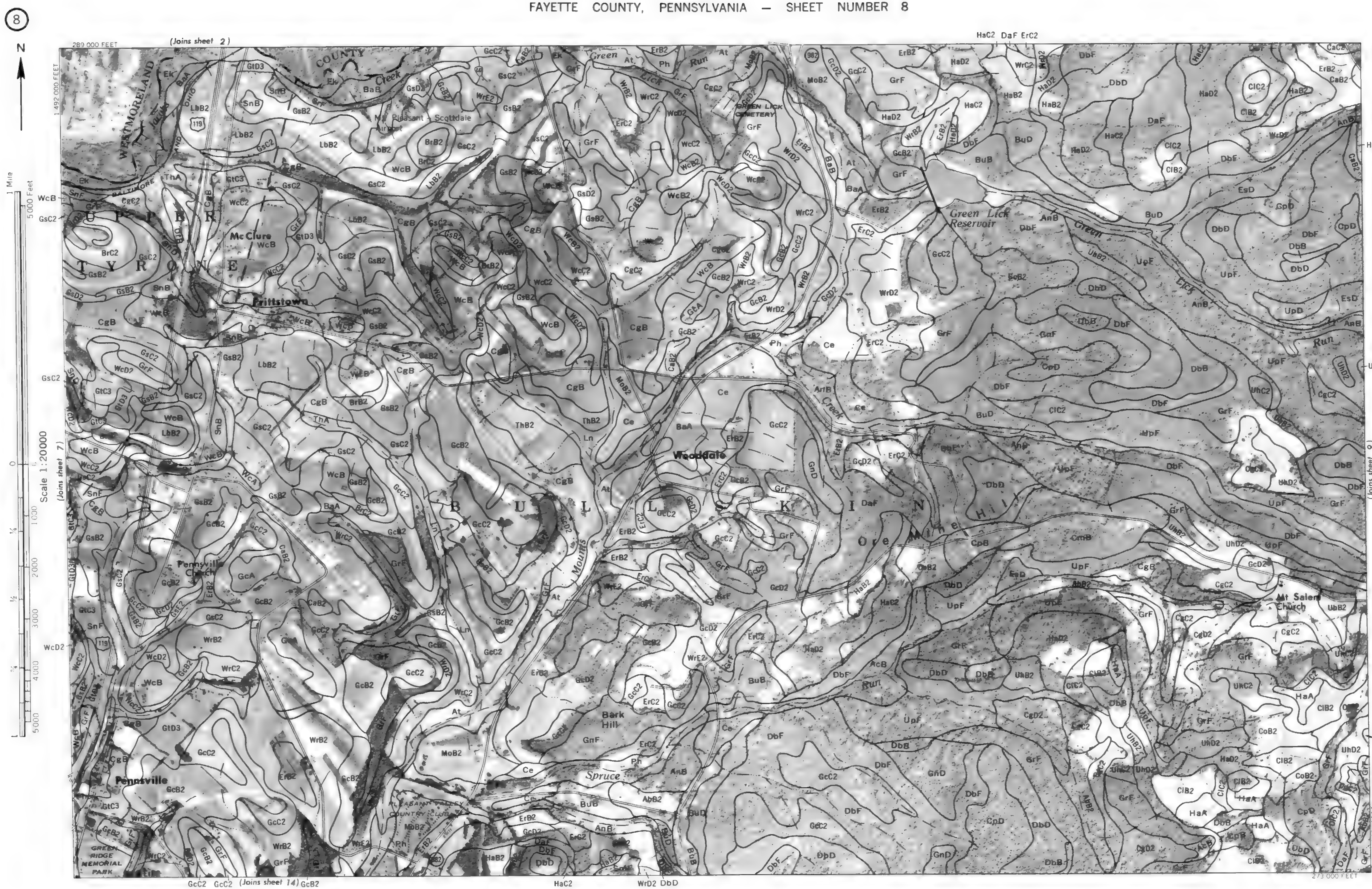

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

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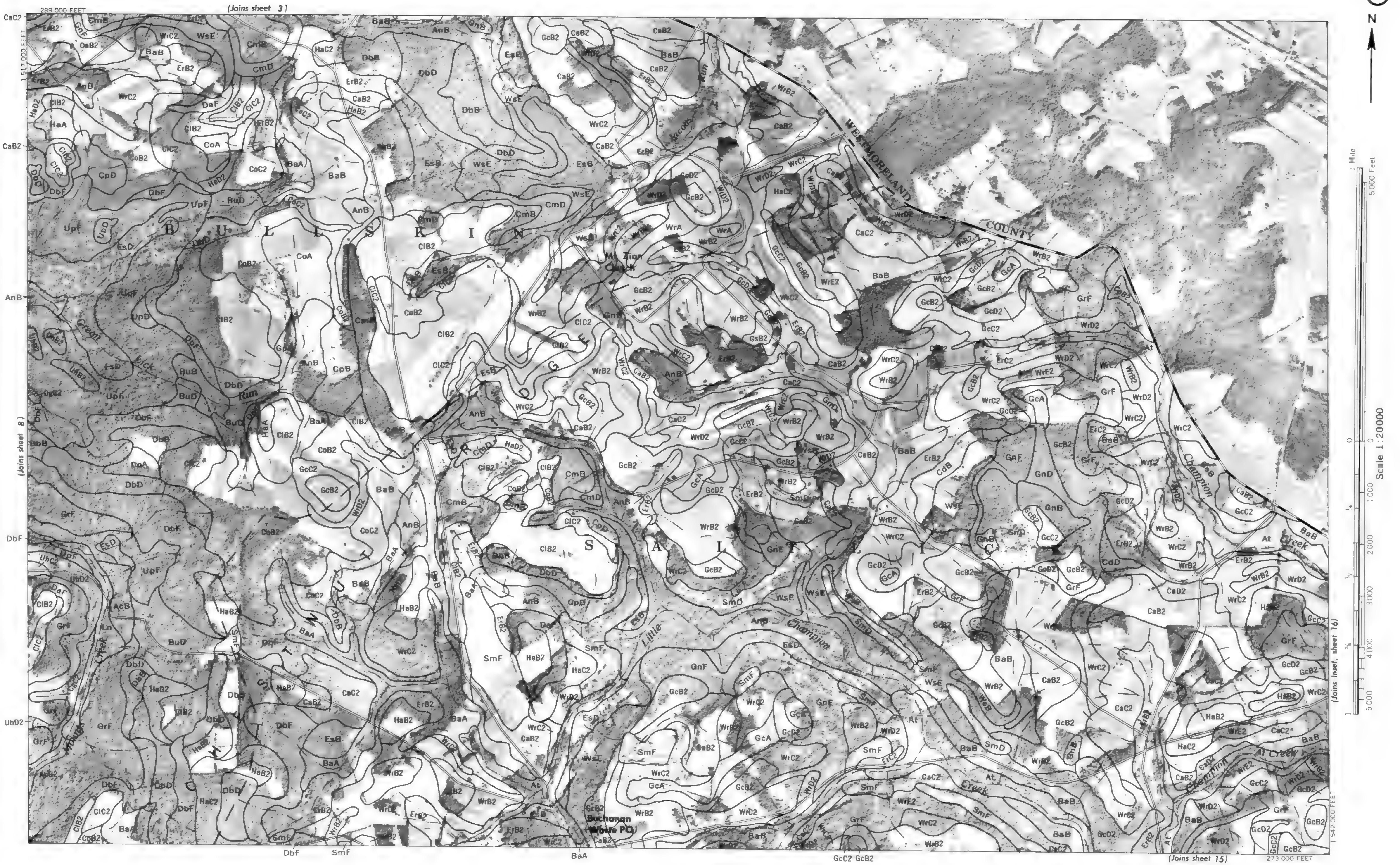
FAYETTE COUNTY, PENNSYLVANIA NO. 8



FAYETTE COUNTY, PENNSYLVANIA NO. 9

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Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 10

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

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11

FAYETTE COUNTY, PENNSYLVANIA NO. 11

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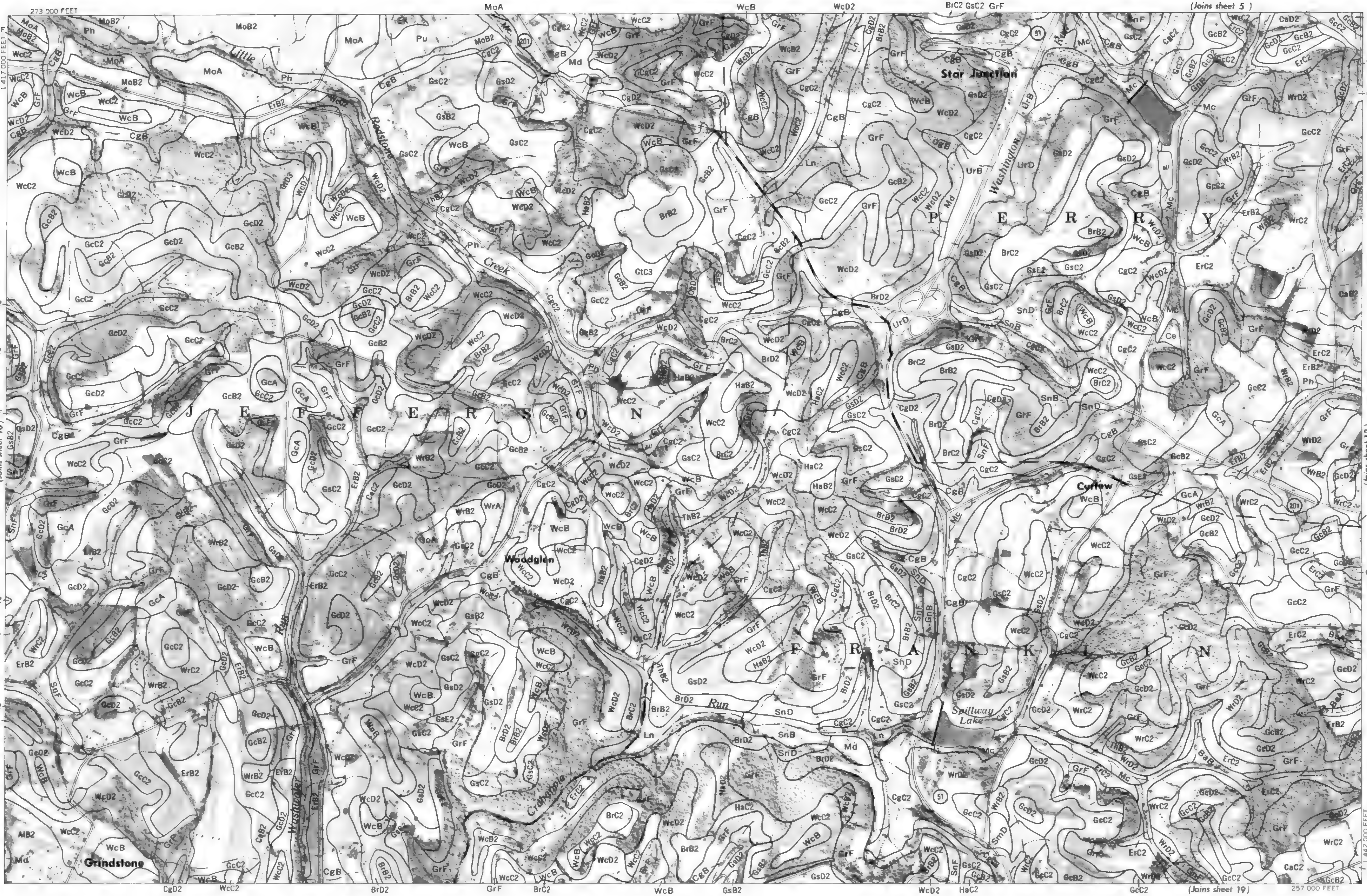
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone, 1927 North American datum



N

Scale 1:20000

1 Mile

5000 Feet

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 12

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

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FAYETTE COUNTY, PENNSYLVANIA NO. 12

FAYETTE COUNTY, PENNSYLVANIA NO. 13

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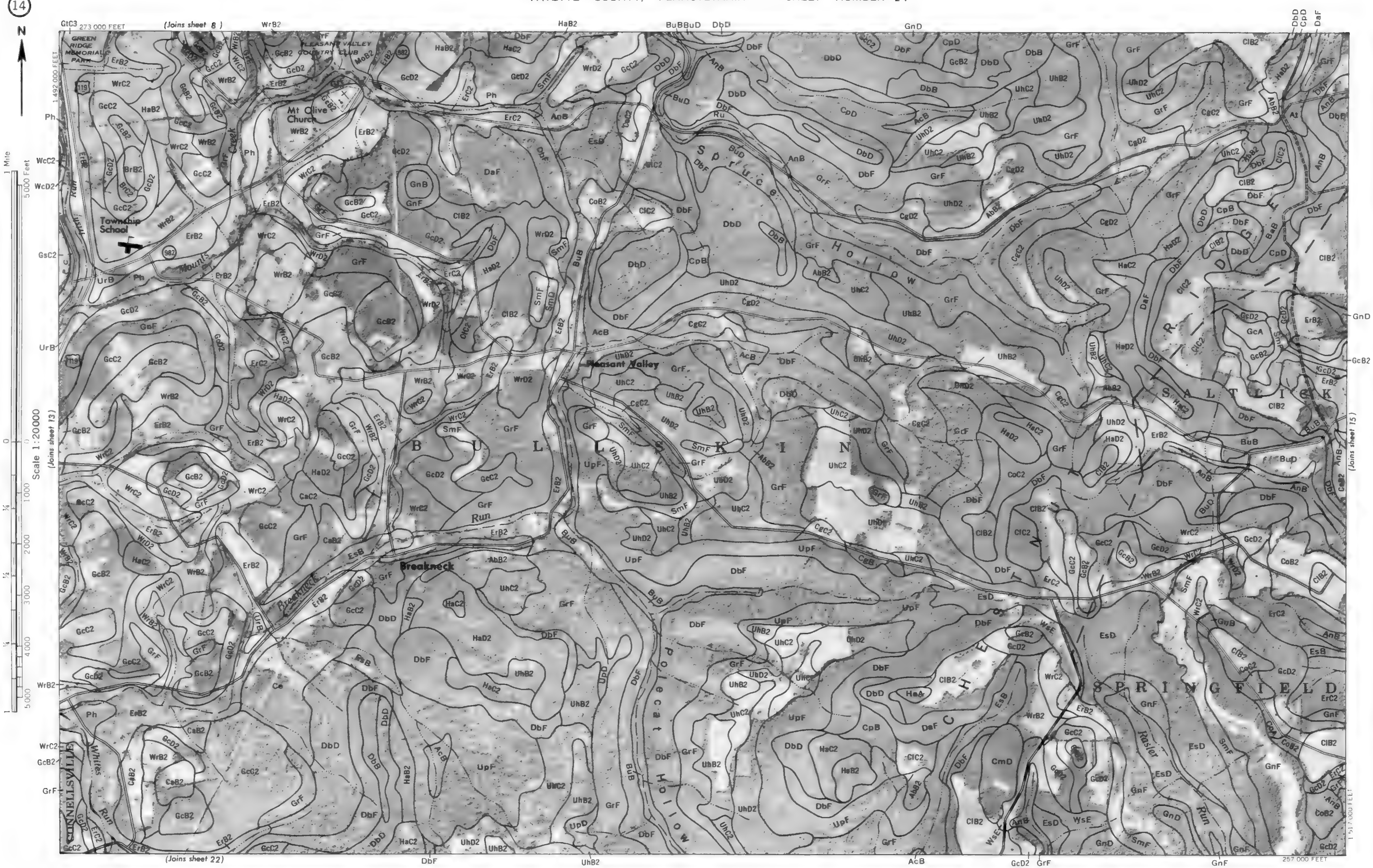
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

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FAYETTE COUNTY, PENNSYLVANIA NO. 15
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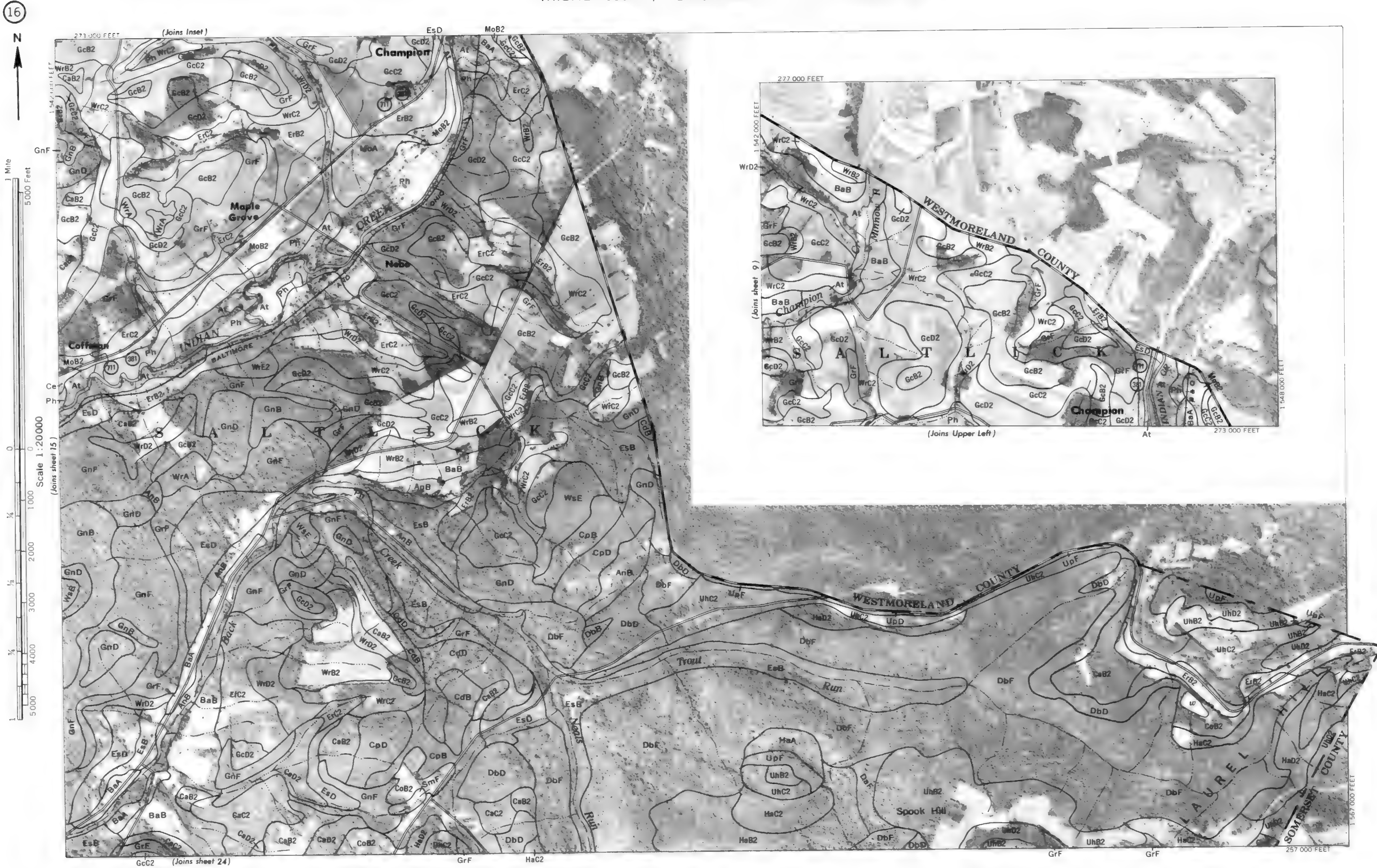
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone 1927 North American datum



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FAYETTE COUNTY, PENNSYLVANIA NO. 17

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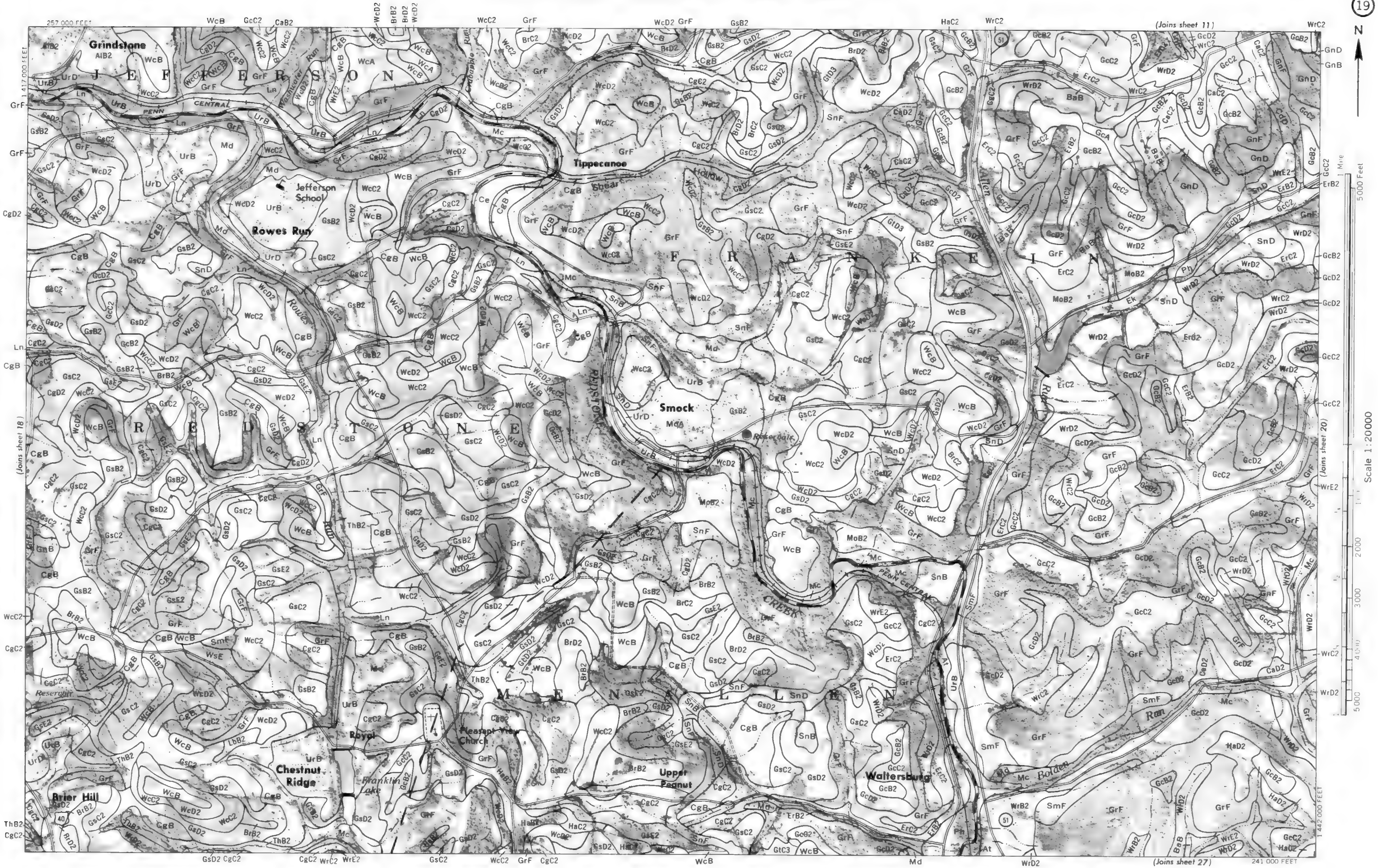
FAYETTE COUNTY, PENNSYLVANIA NO. 18

19



FAYETTE COUNTY, PENNSYLVANIA NO. 19

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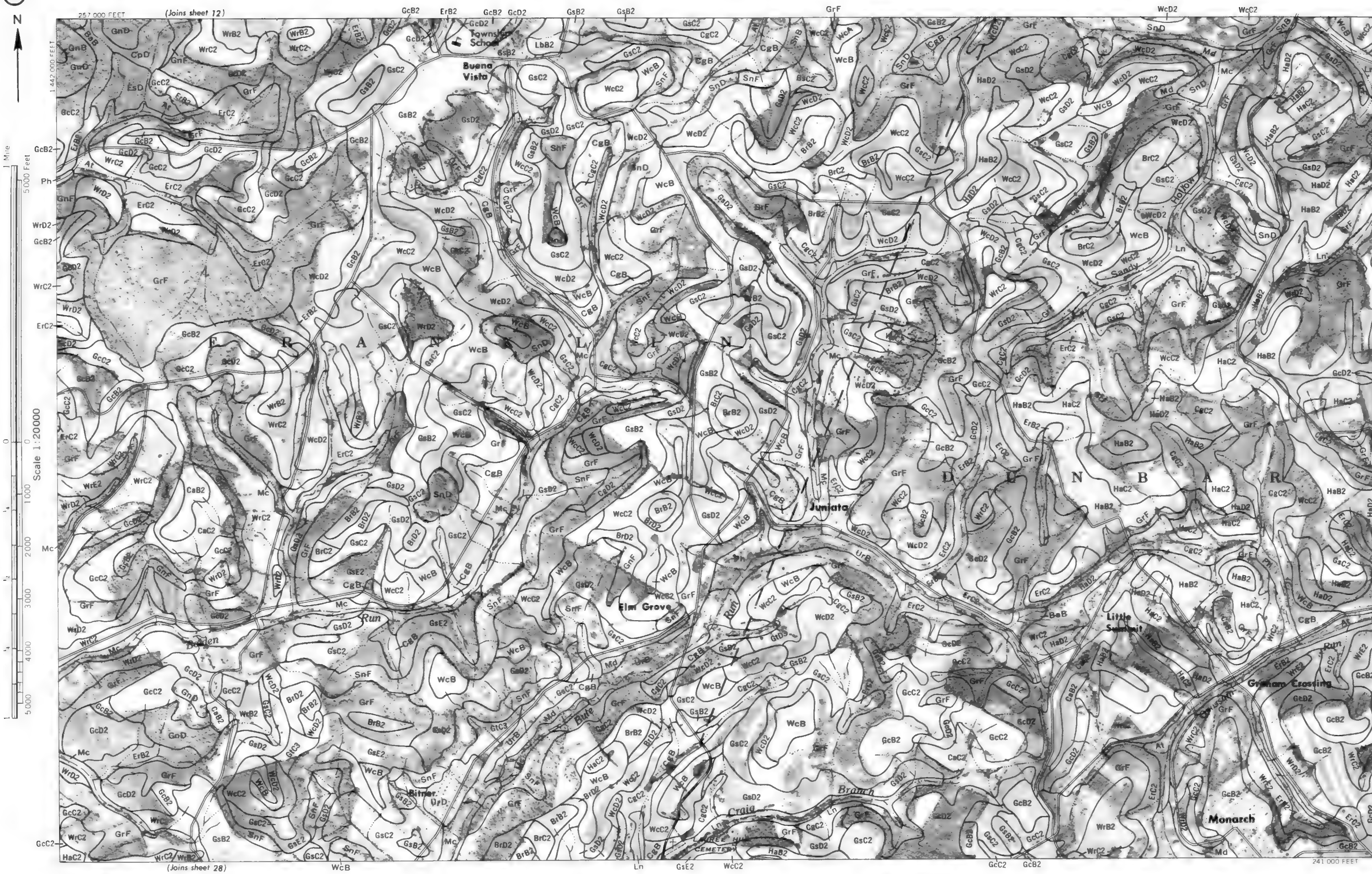
FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 20



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FAYETTE COUNTY, PENNSYLVANIA NO. 20

FAYETTE COUNTY, PENNSYLVANIA NO. 21

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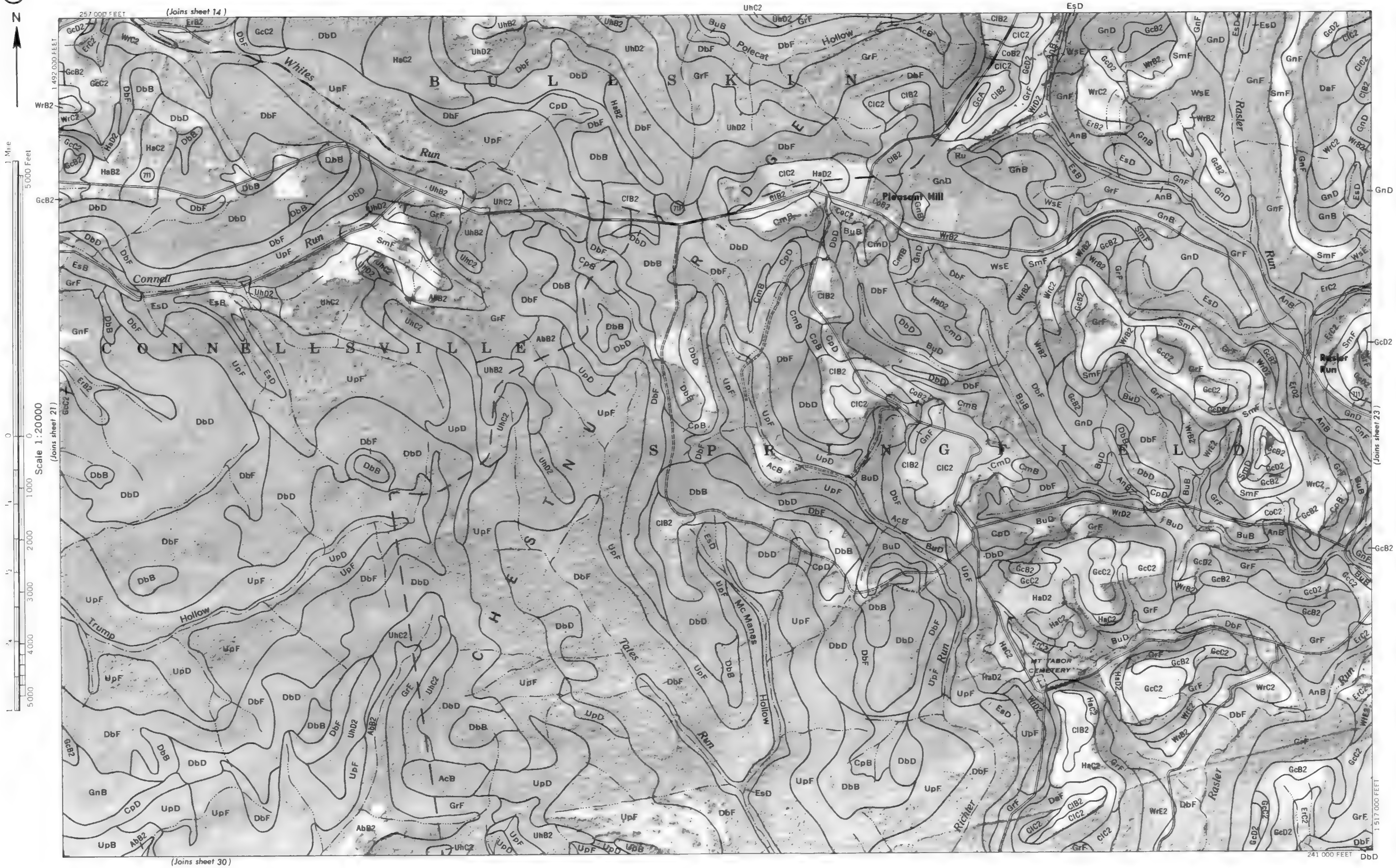
FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 22



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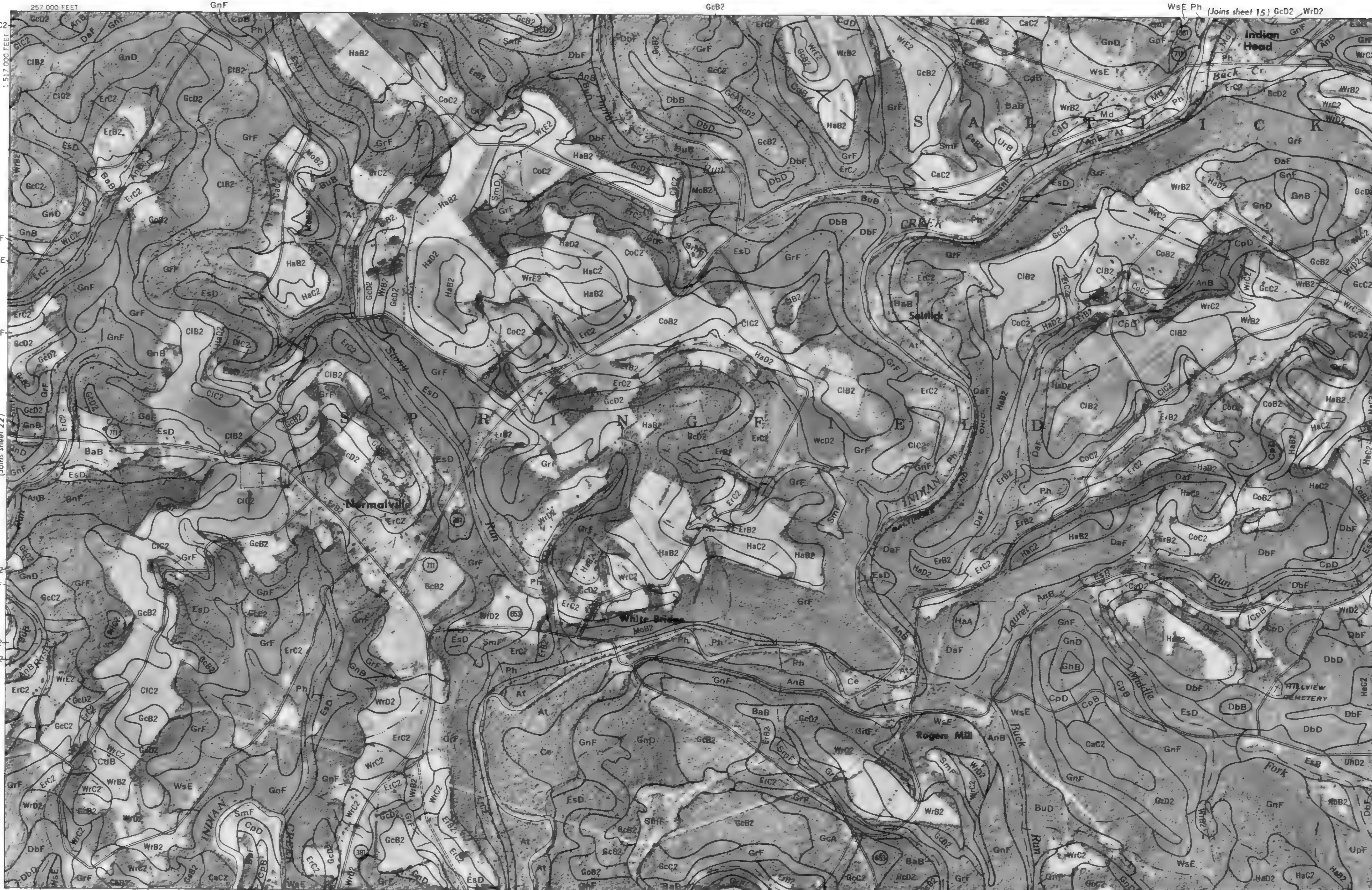
FAYETTE COUNTY, PENNSYLVANIA NO. 22

23



N

Scale 1:20000

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

FAYETTE COUNTY, PENNSYLVANIA NO. 23

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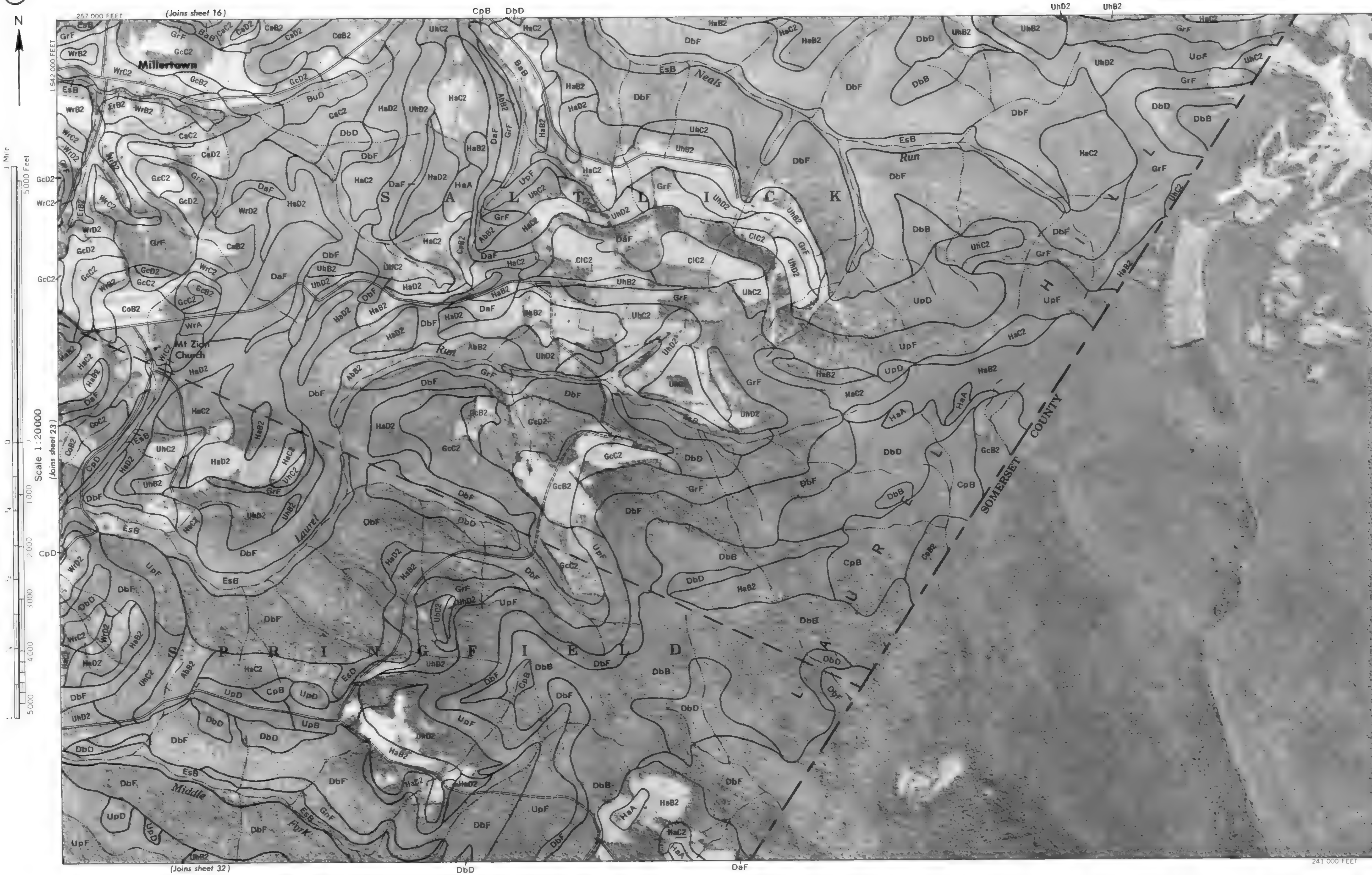
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 24



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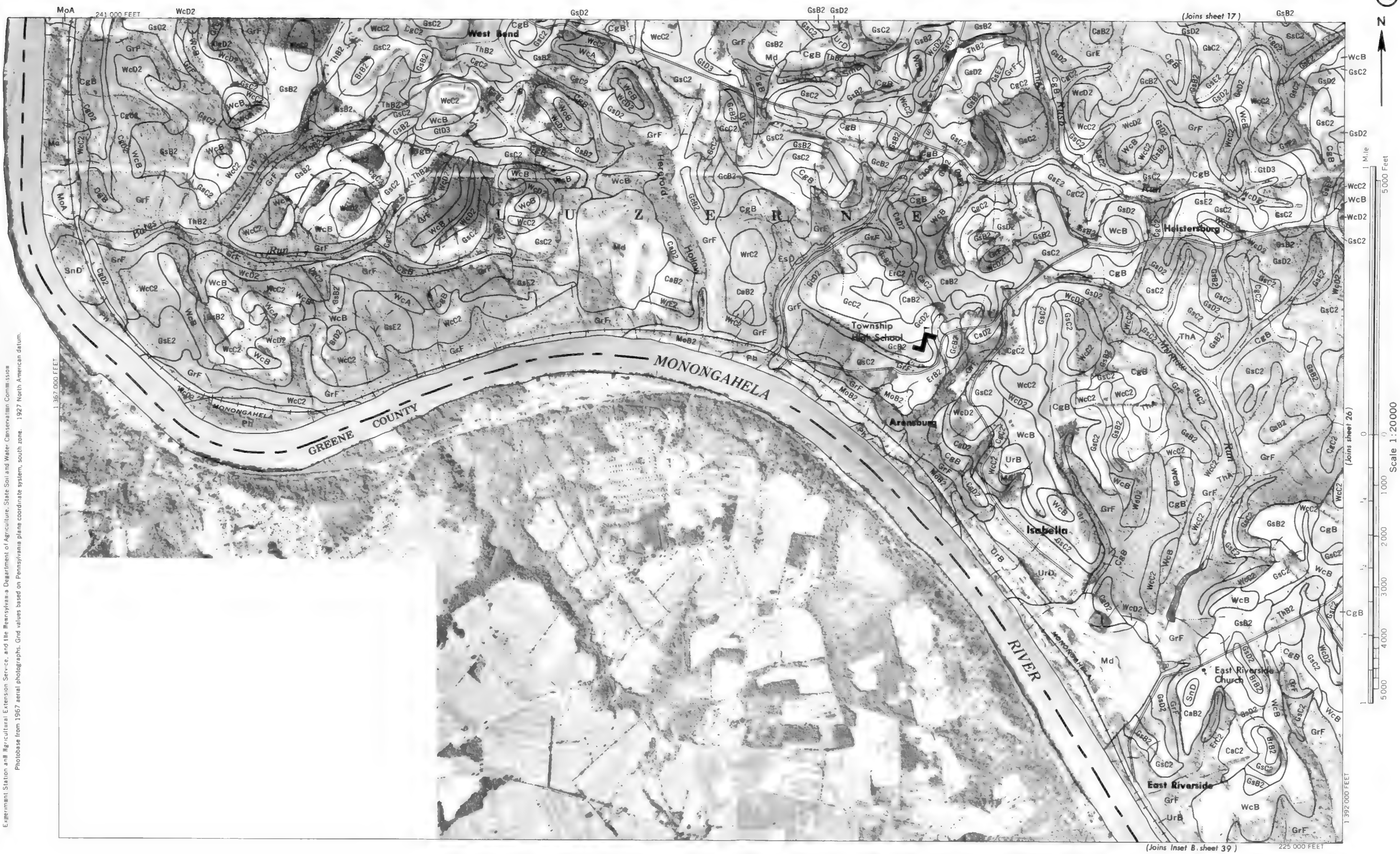
FAYETTE COUNTY, PENNSYLVANIA NO. 24



FAYETTE COUNTY, PENNSYLVANIA NO. 25

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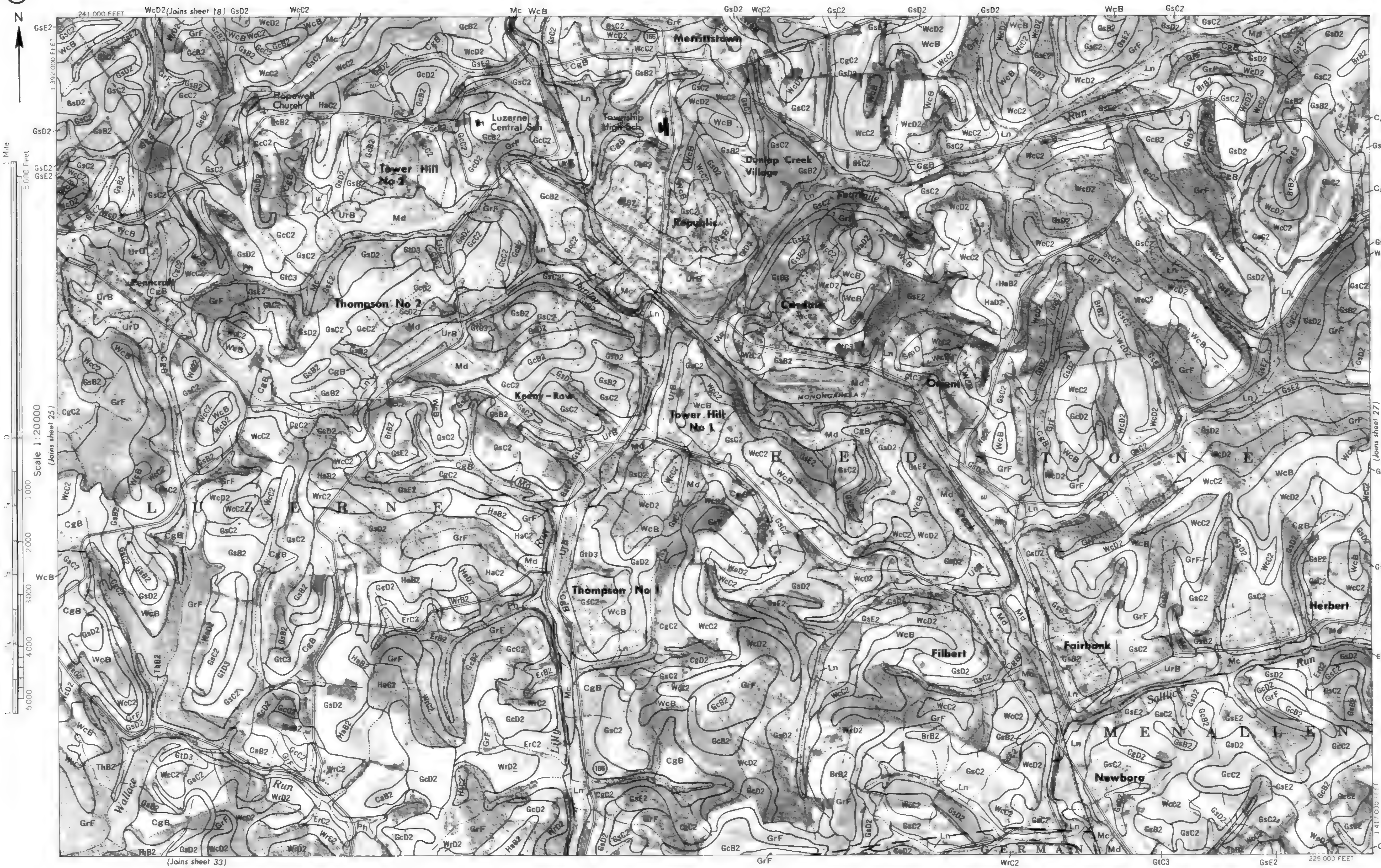

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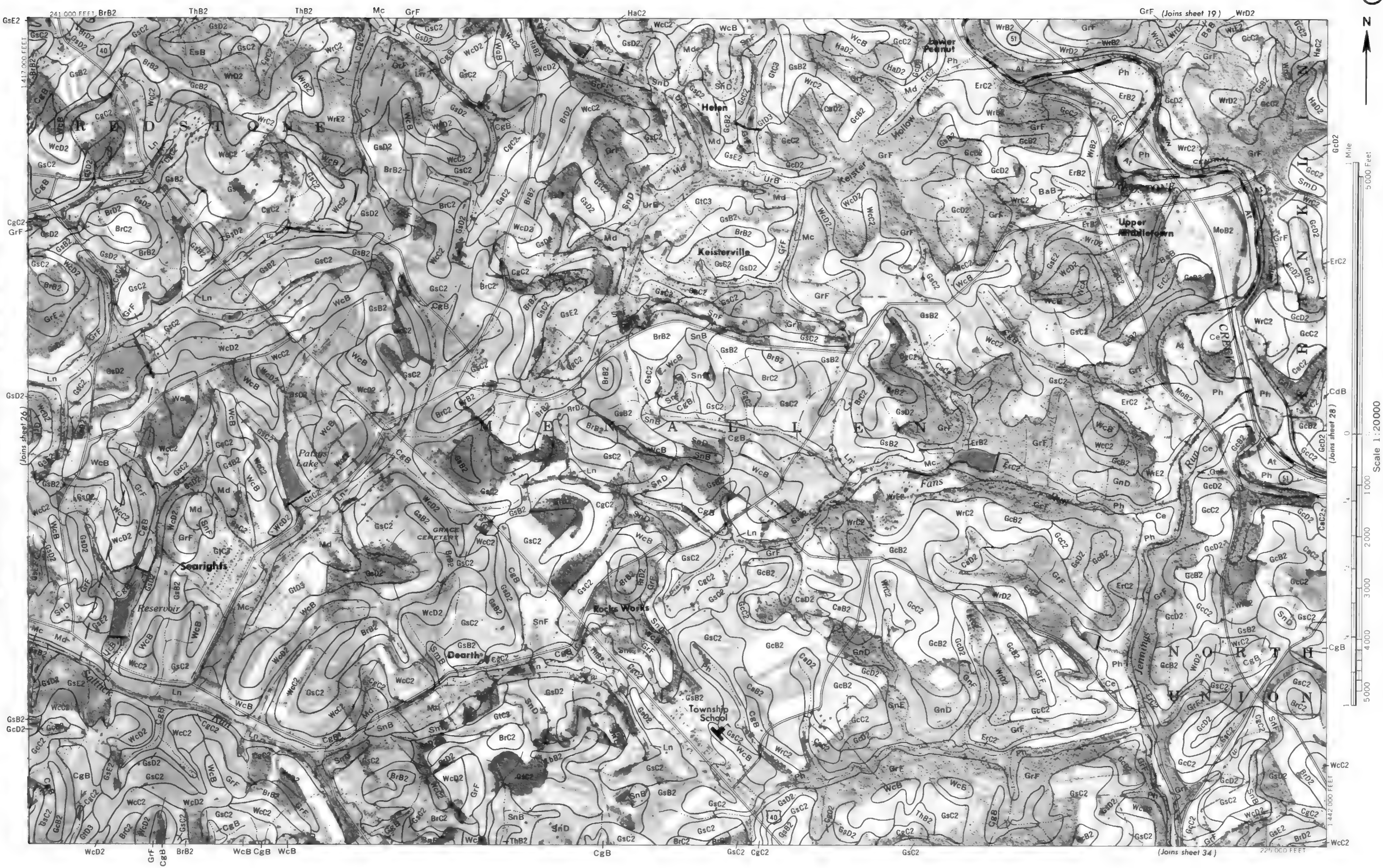

FAYETTE COUNTY, PENNSYLVANIA NO. 27

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Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 28

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

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FAYETTE COUNTY, PENNSYLVANIA NO. 28

FAYETTE COUNTY, PENNSYLVANIA NO. 29

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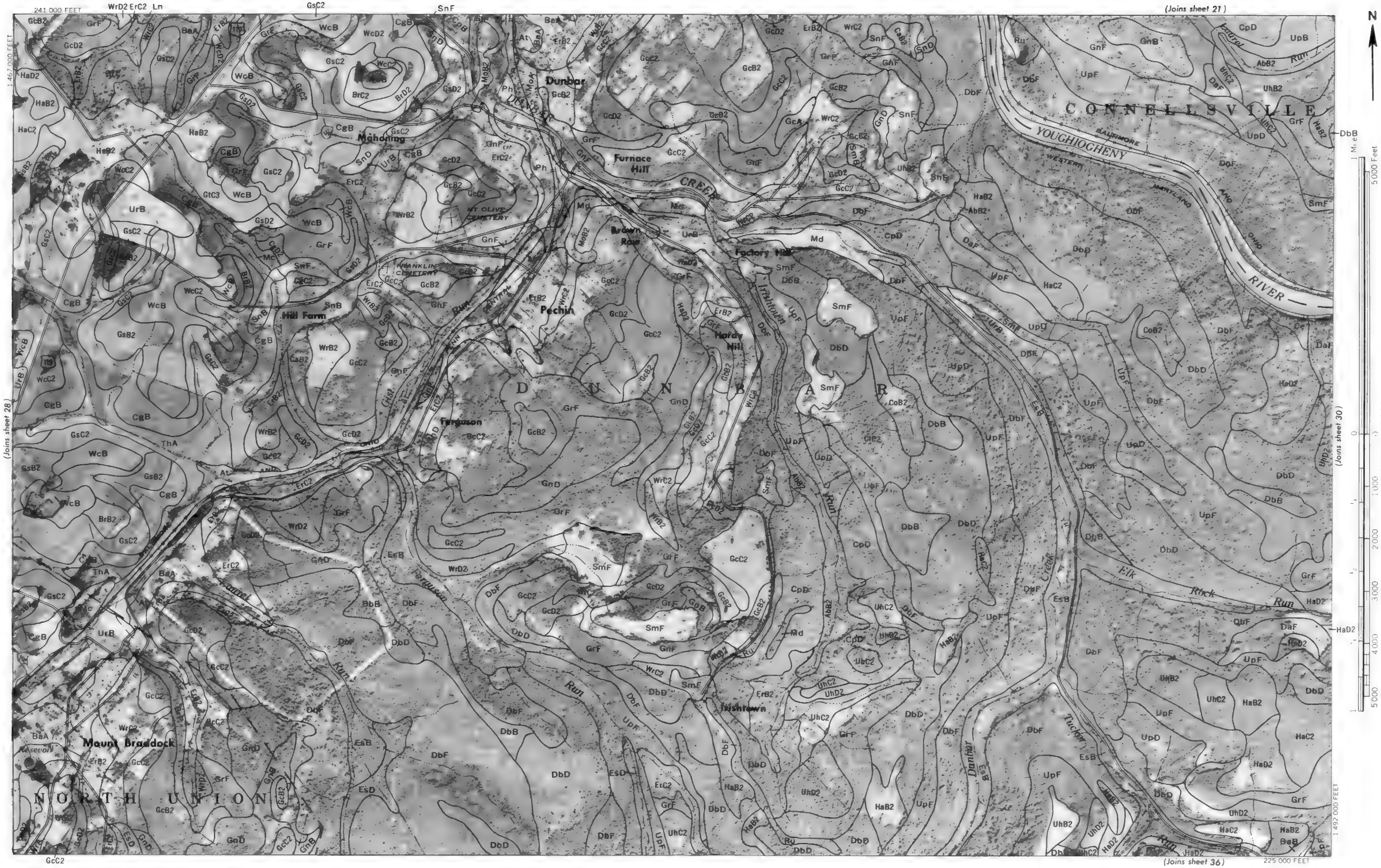

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 30

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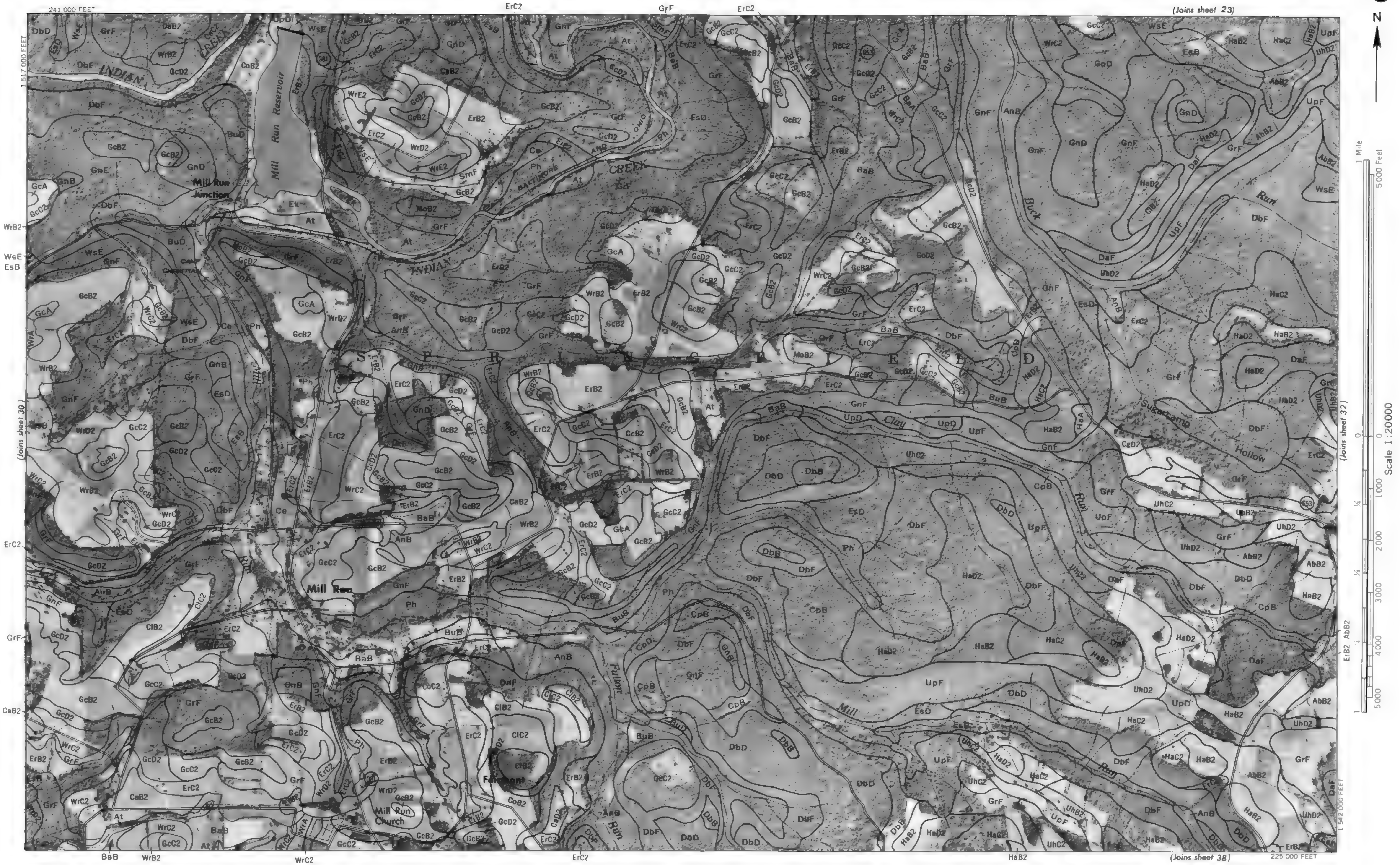


FAYETTE COUNTY, PENNSYLVANIA NO. 31

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 32

N

1 Mile

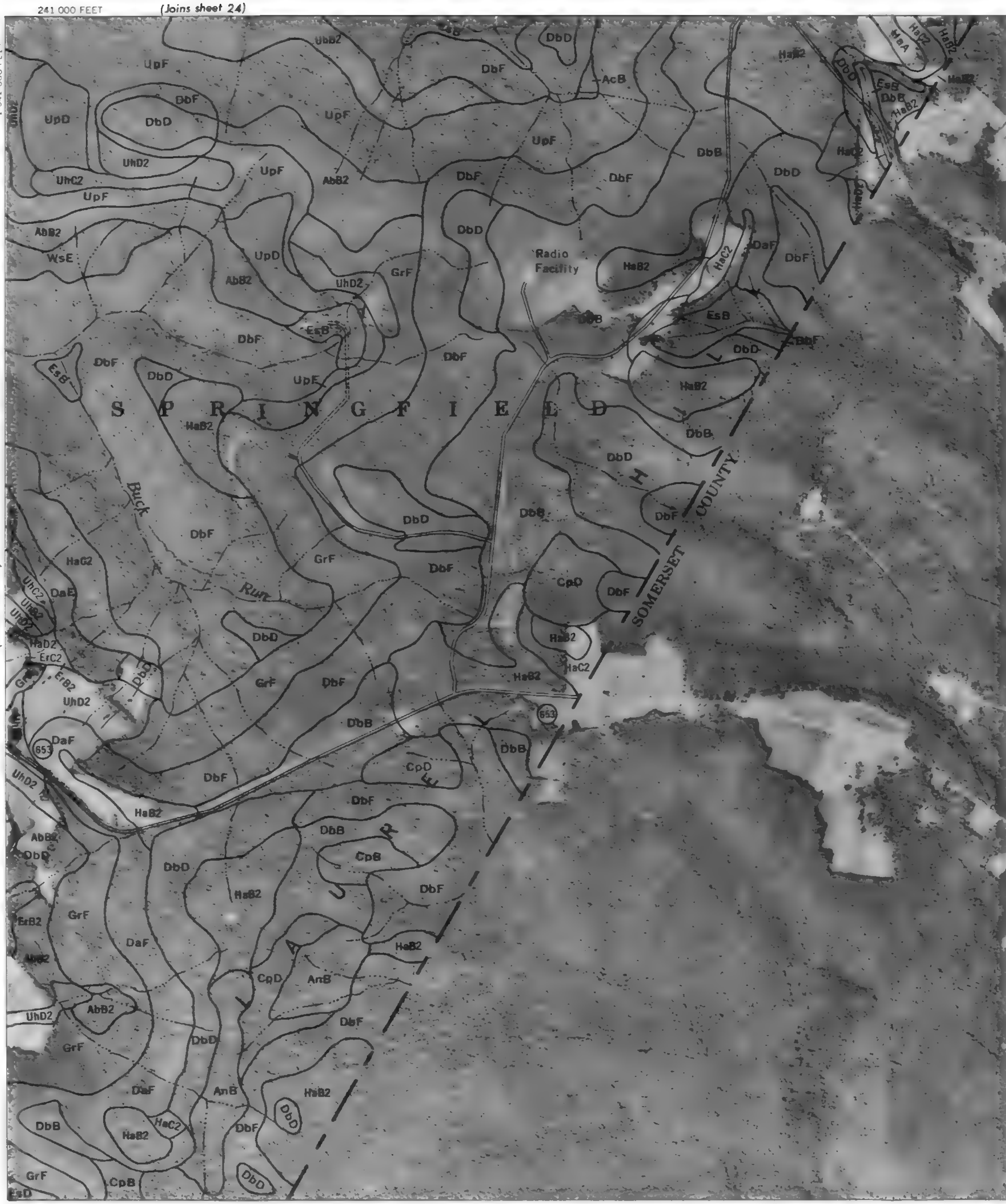
5000 Feet

Scale 1:20000

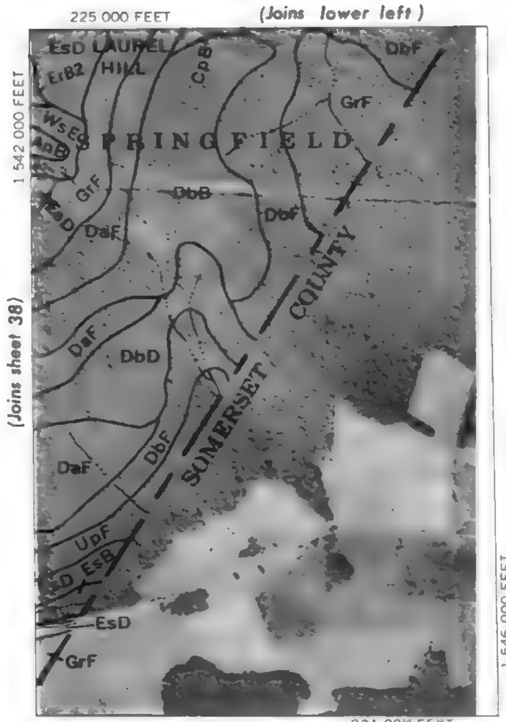
0 1000 2000 3000 4000 5000

241 000 FEET (Joins sheet 24)

(Joins sheet 31)



(Joins inset)



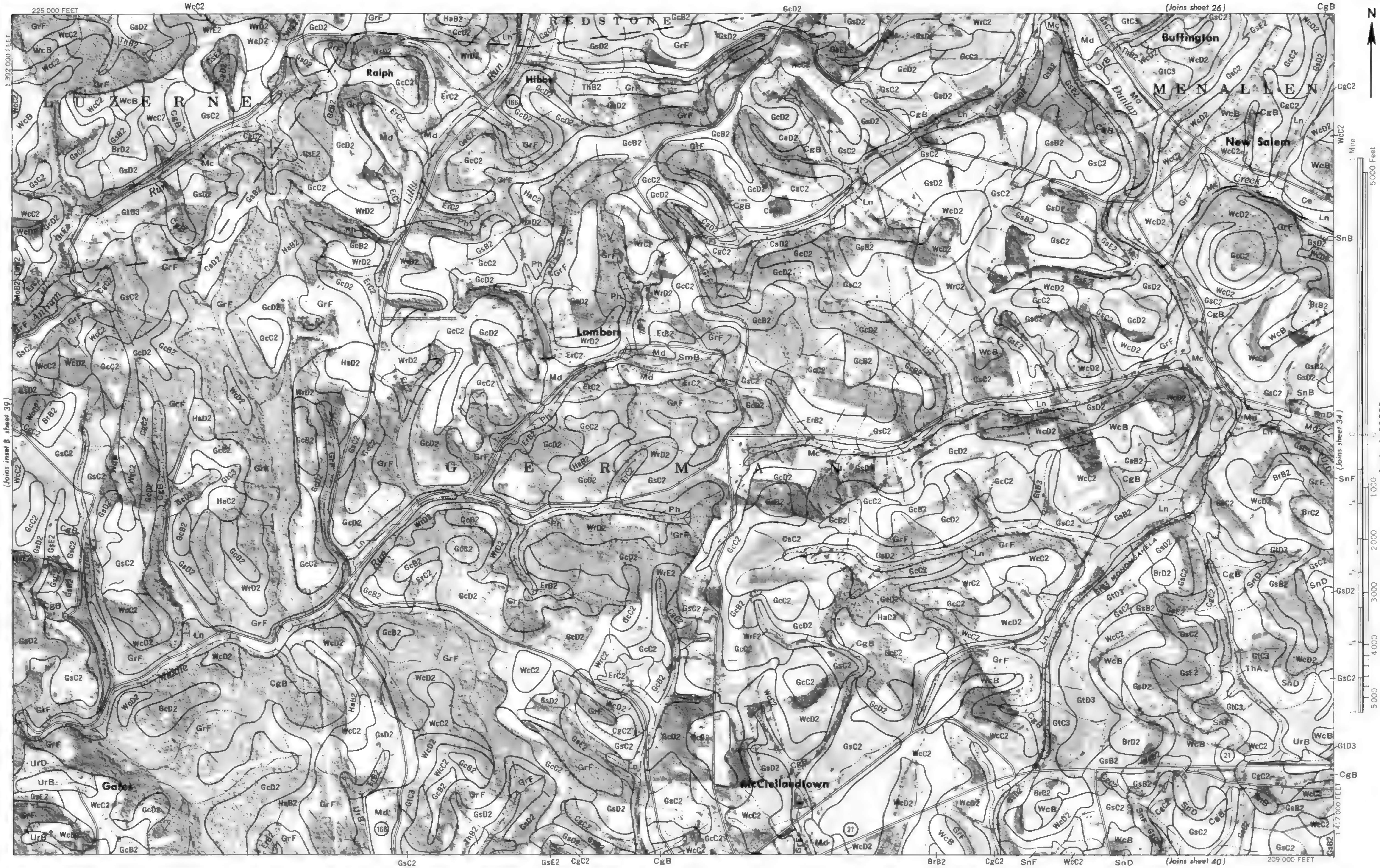
1 567 000 FEET

225 000 FEET

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

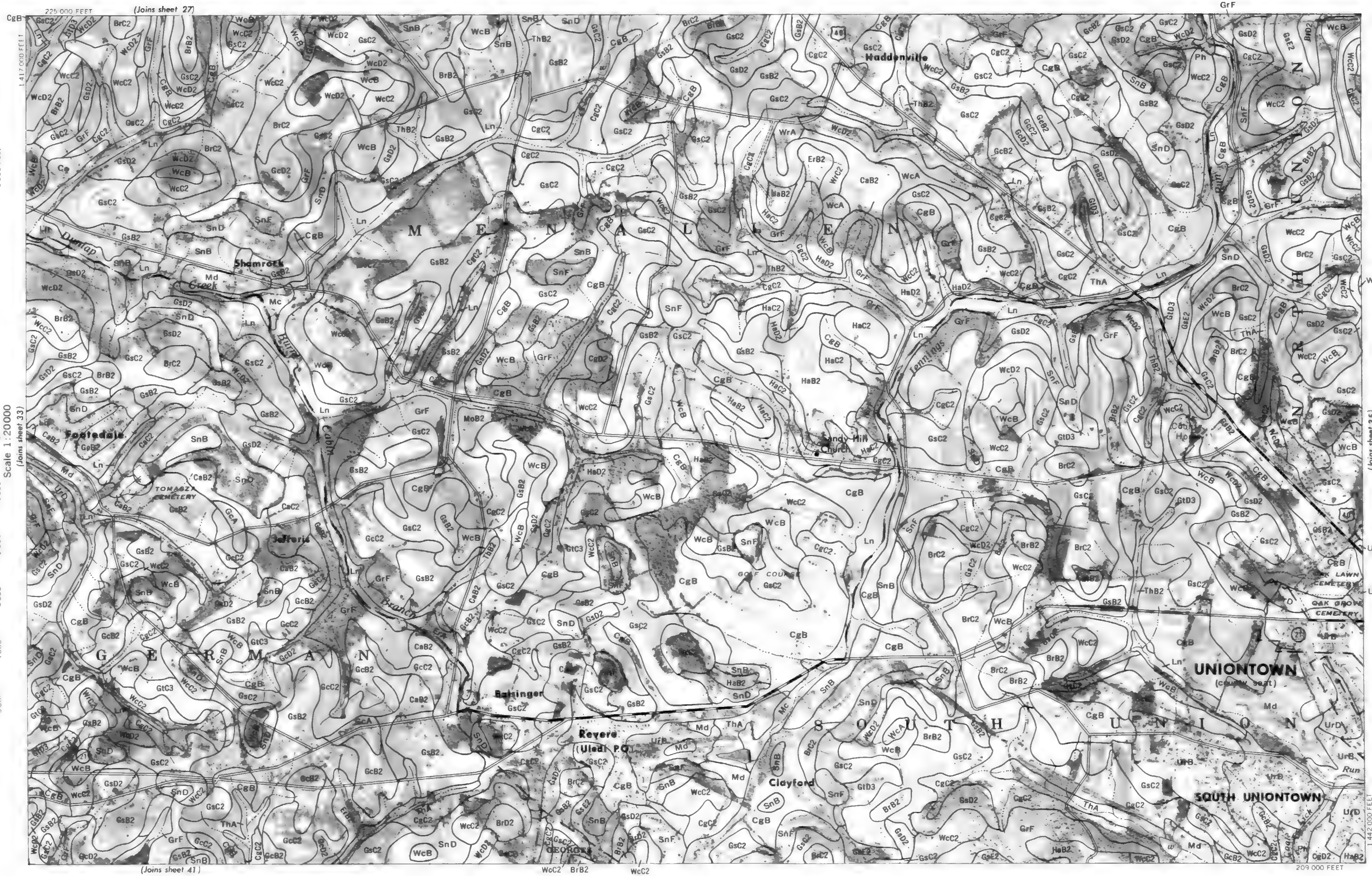
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

33



FAYETTE COUNTY, PENNSYLVANIA NO. 33

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

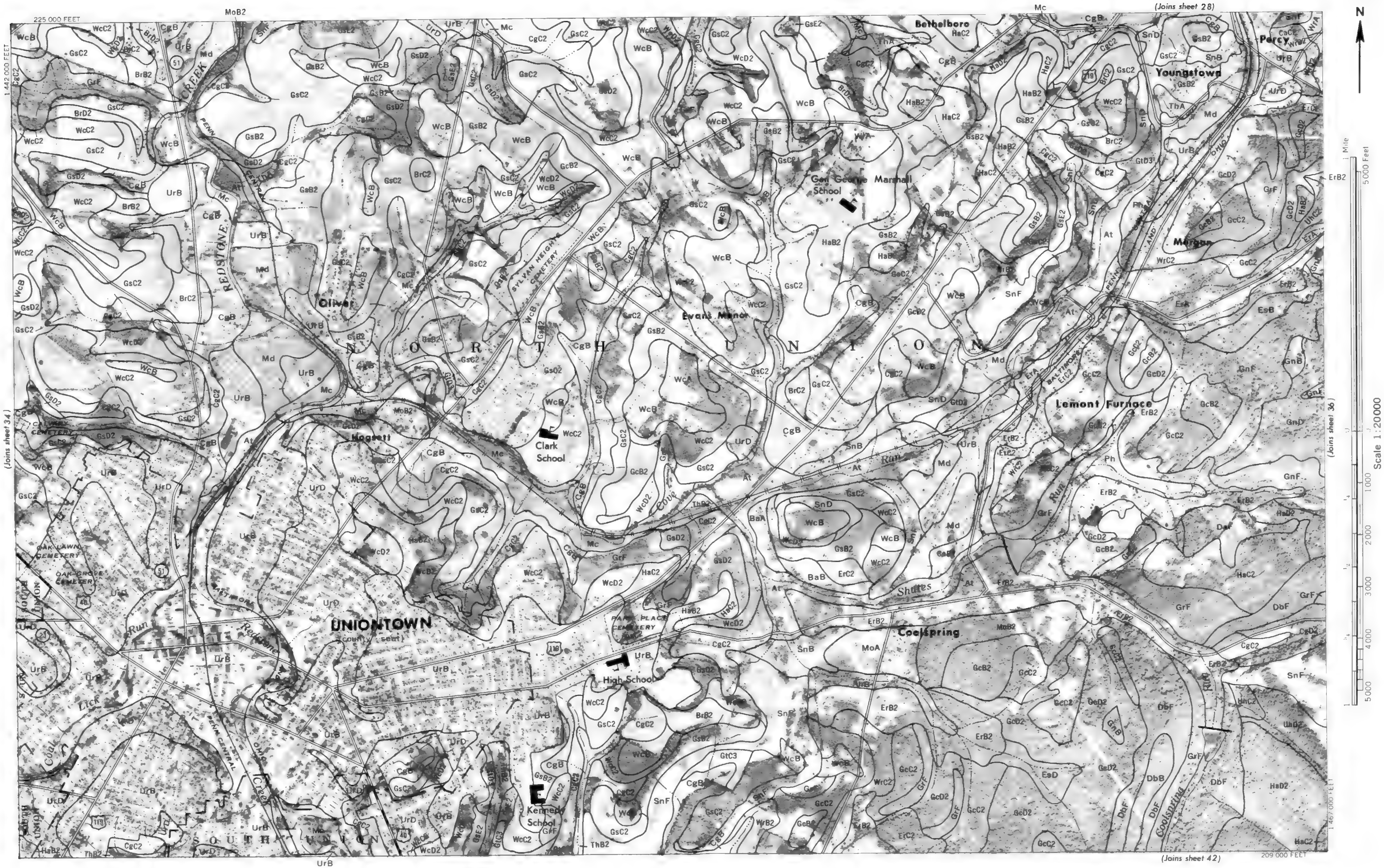
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

FAYETTE COUNTY, PENNSYLVANIA NO. 34

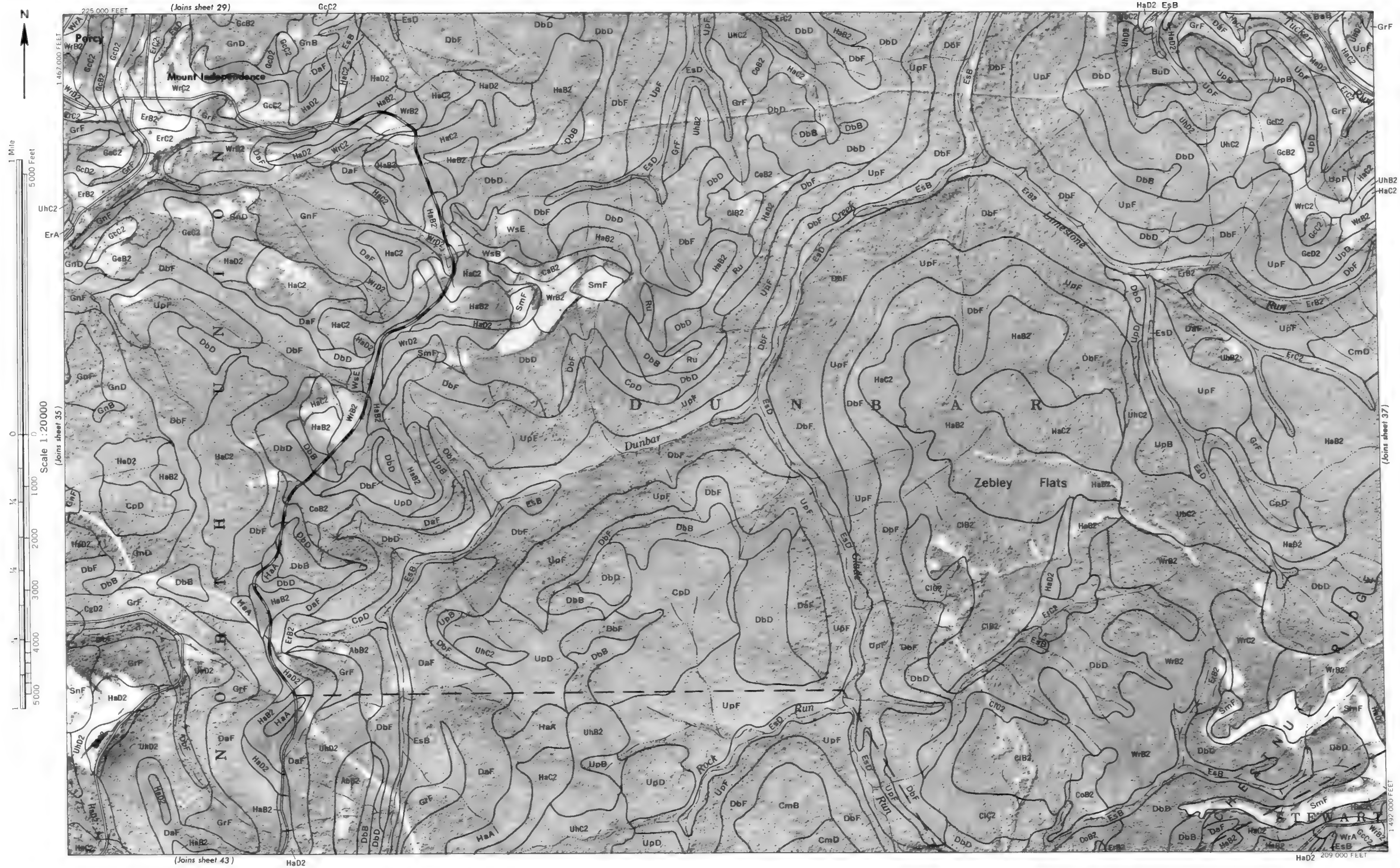
FAYETTE COUNTY, PENNSYLVANIA NO. 35

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum



FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 36



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

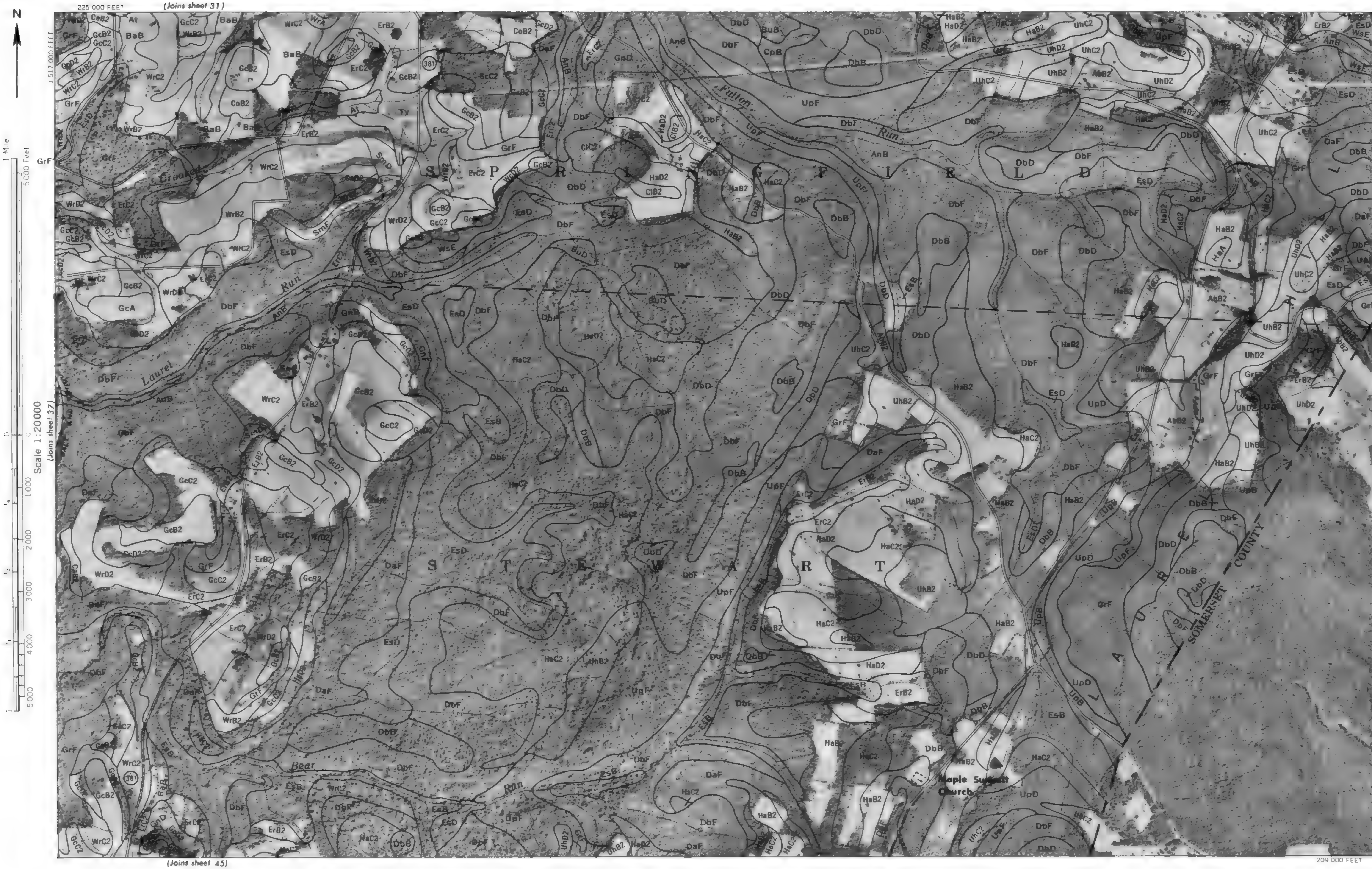
FAYETTE COUNTY, PENNSYLVANIA NO. 36

FAYETTE COUNTY, PENNSYLVANIA NO. 37

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 38



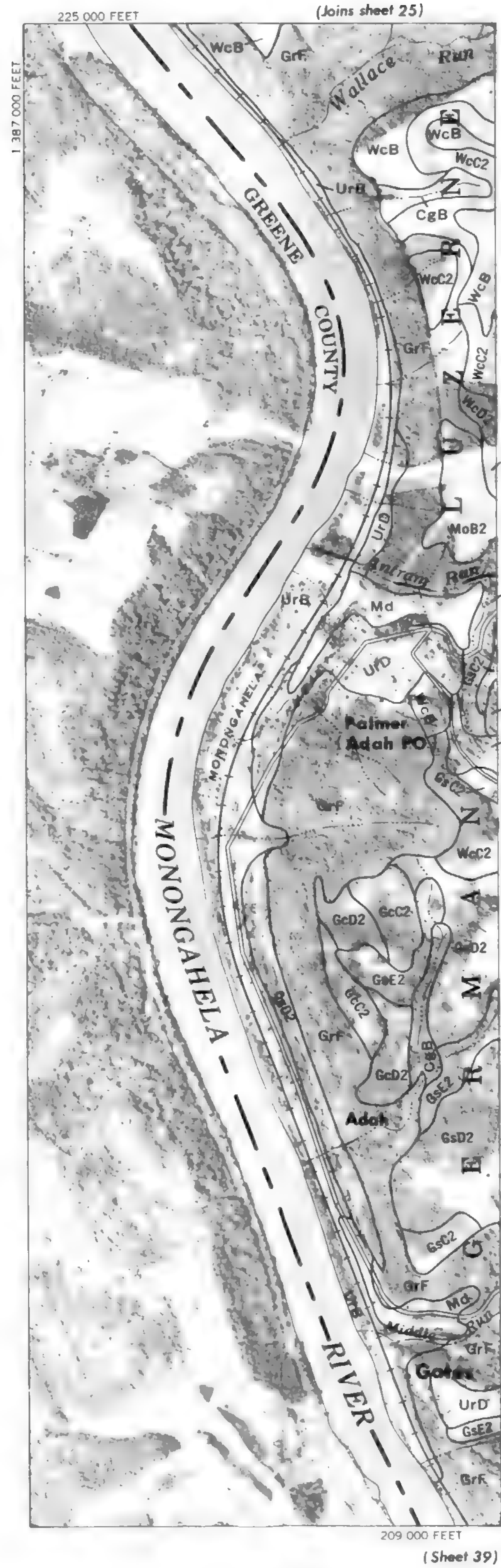
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

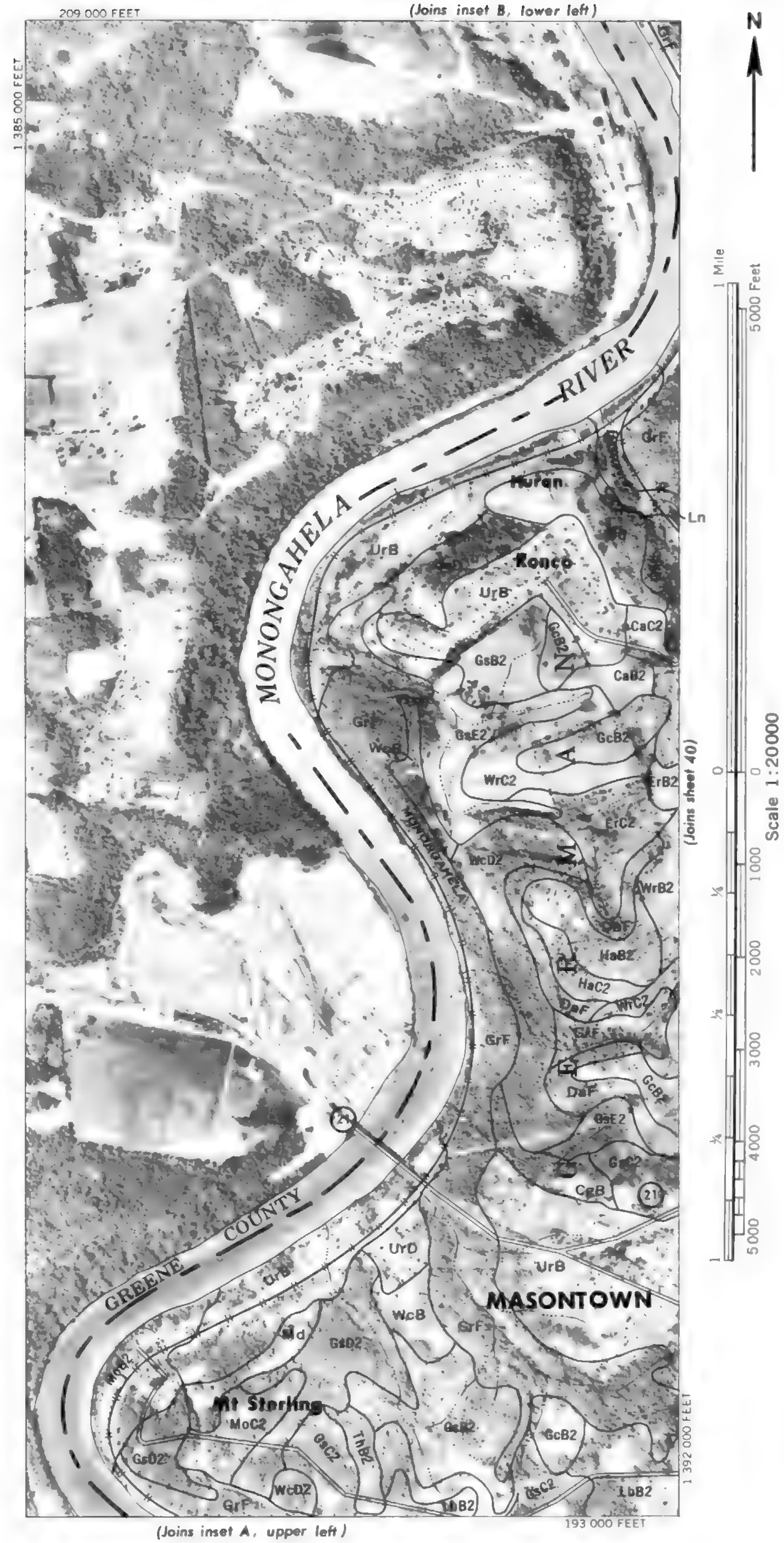
FAYETTE COUNTY, PENNSYLVANIA NO. 39

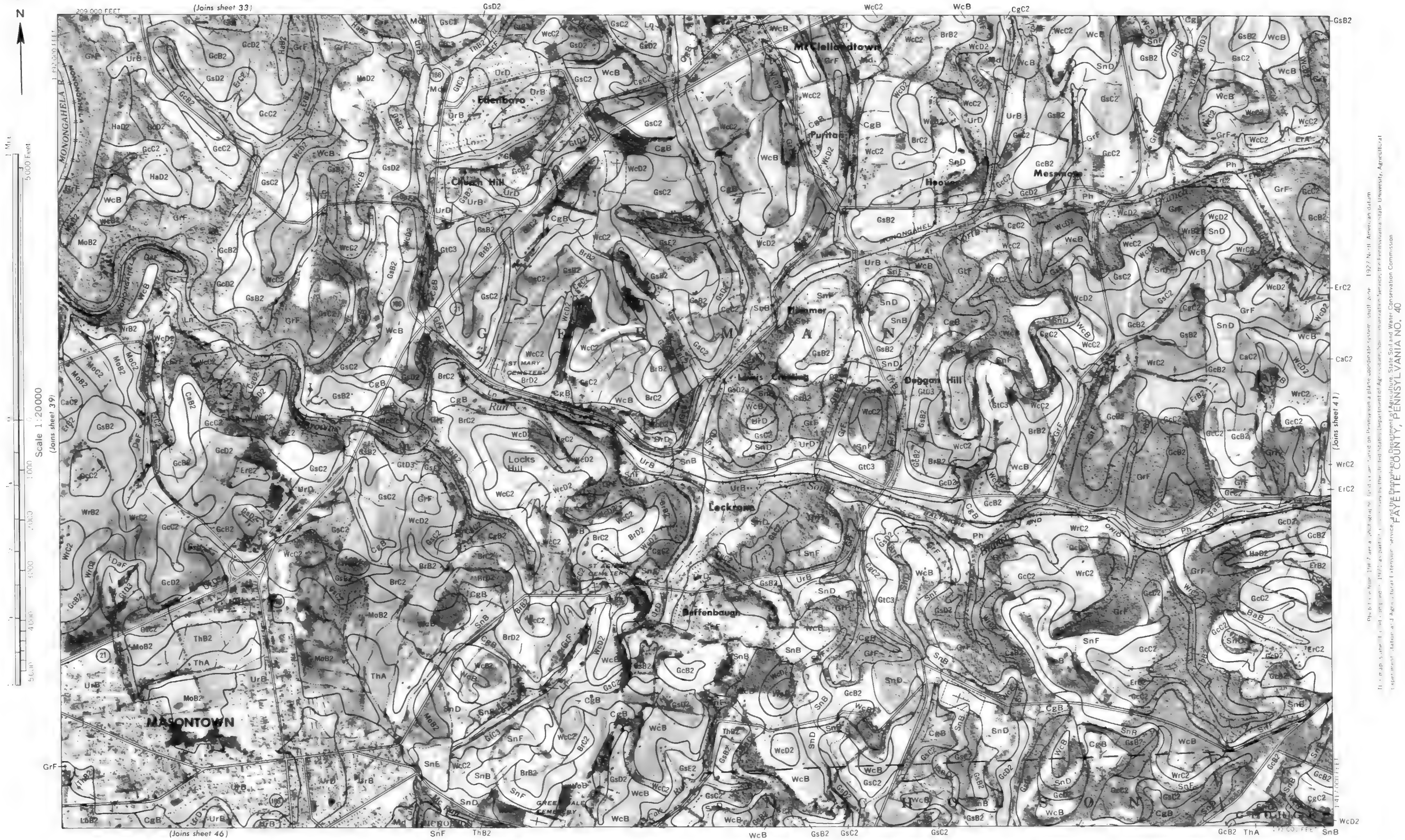
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

INSET A



INSET B



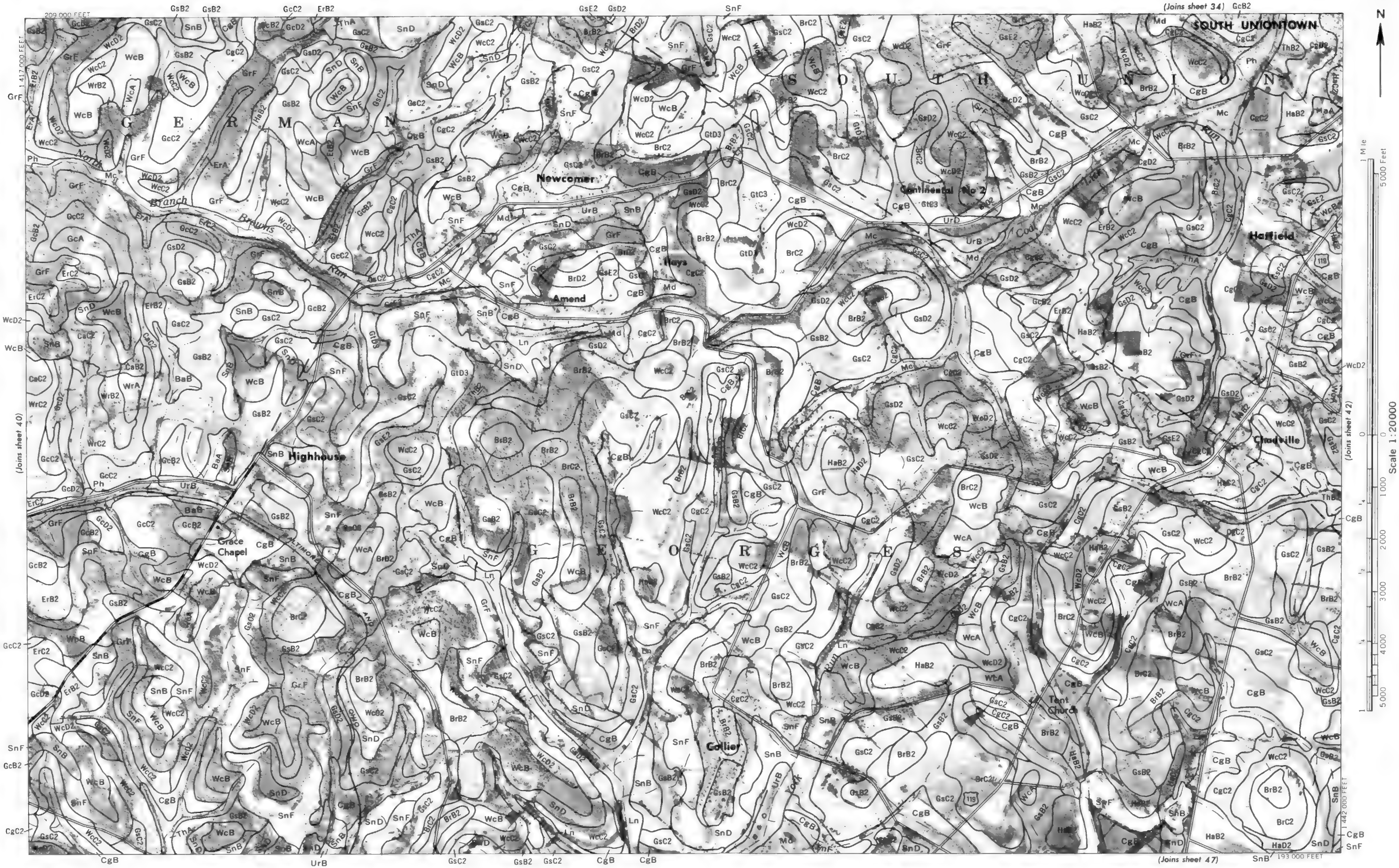

N
(Joins sheet 33)
(Joins sheet 39)
(Joins sheet 41)
(Joins sheet 46)
Scale 1:20000
5000 Feet
McClellandtown
Edenboro
Church Hill
Puritan
Locks Hill
Leckrone
Lewis Crossing
Beffenbaugh
MASONTOWN
MONONGAHELA
ST MARY CEMETERY
ST AGNES CEMETERY
BALTIMORE AND OHIO
FAYETTE COUNTY, PENNSYLVANIA NO. 40

41

FAYETTE COUNTY, PENNSYLVANIA NO. 41

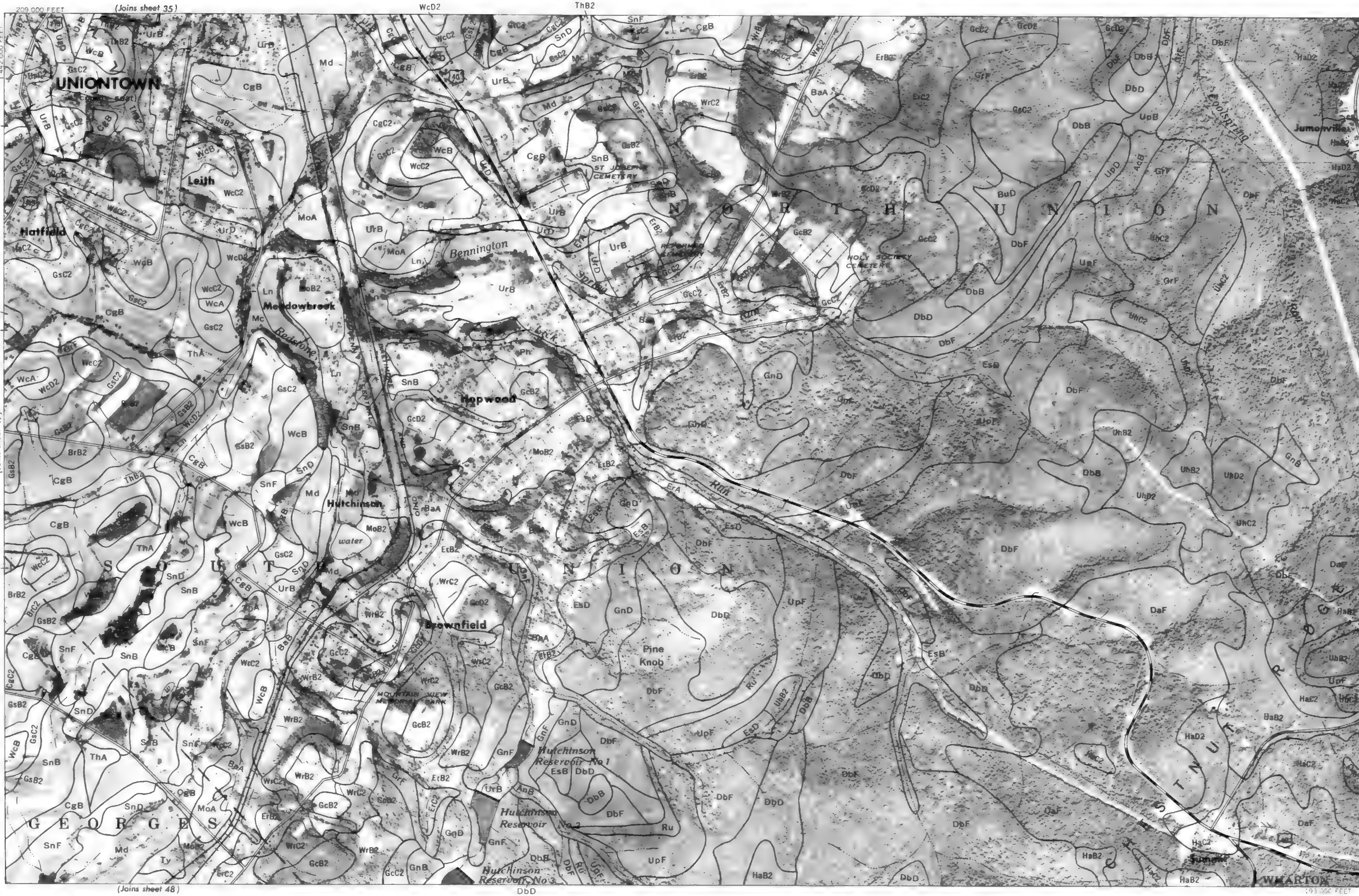
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.



FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 42

N



Scale 1:20000

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

FAYETTE COUNTY, PENNSYLVANIA NO. 42

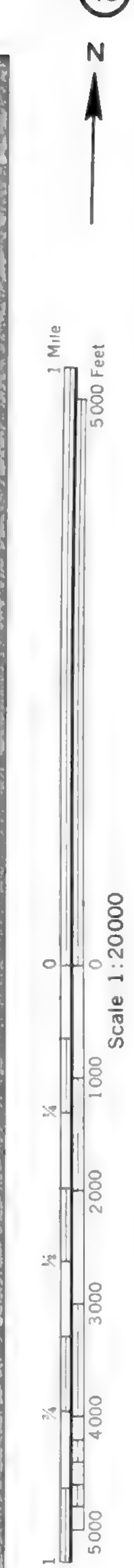
FAYETTE COUNTY, PENNSYLVANIA NO. 43
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 44

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

This map is compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

FAYETTE COUNTY, PENNSYLVANIA NO. 44

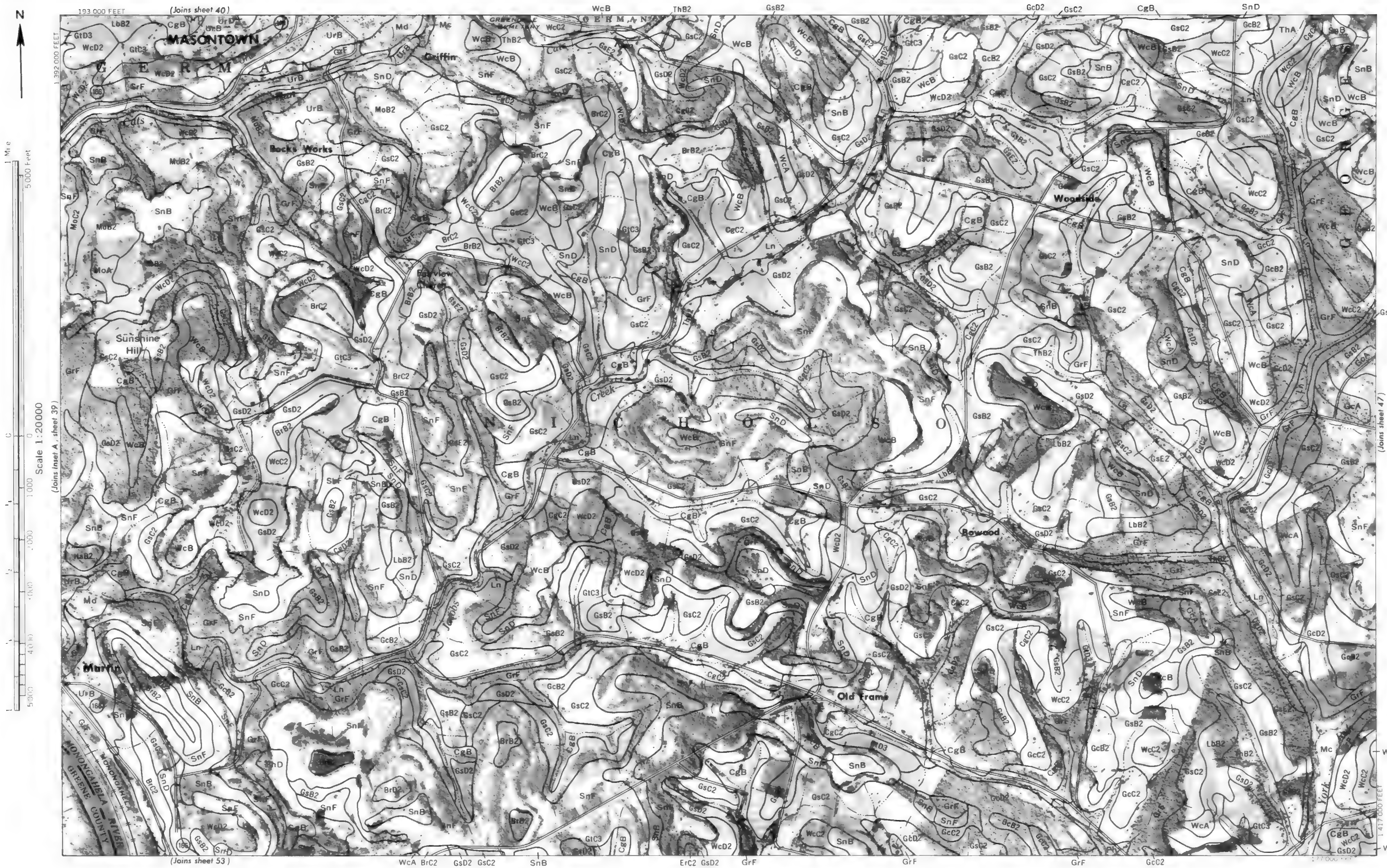


FAYETTE COUNTY, PENNSYLVANIA NO. 45

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 46



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

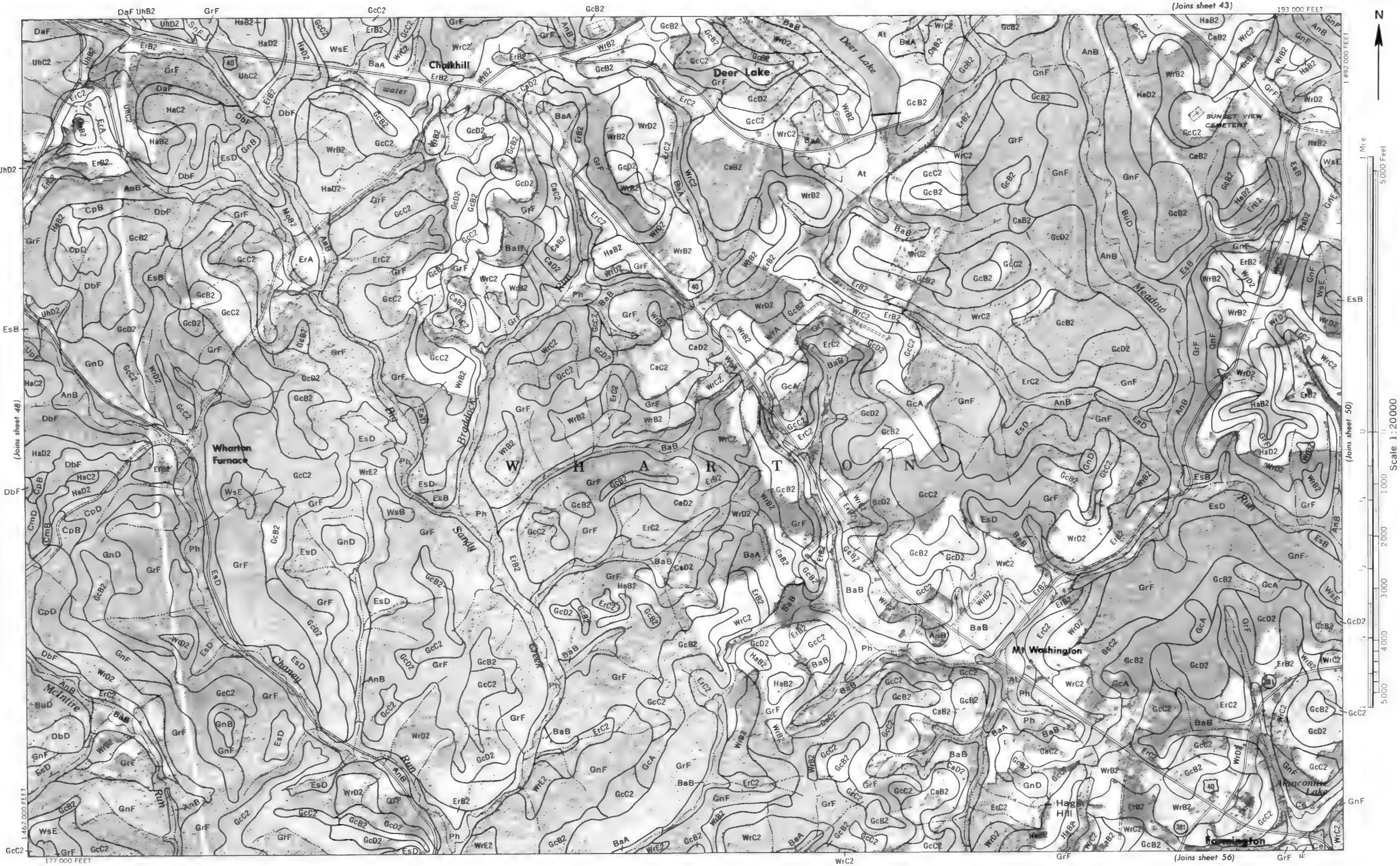
FAYETTE COUNTY, PENNSYLVANIA NO. 46

FAYETTE COUNTY, PENNSYLVANIA NO. 47

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

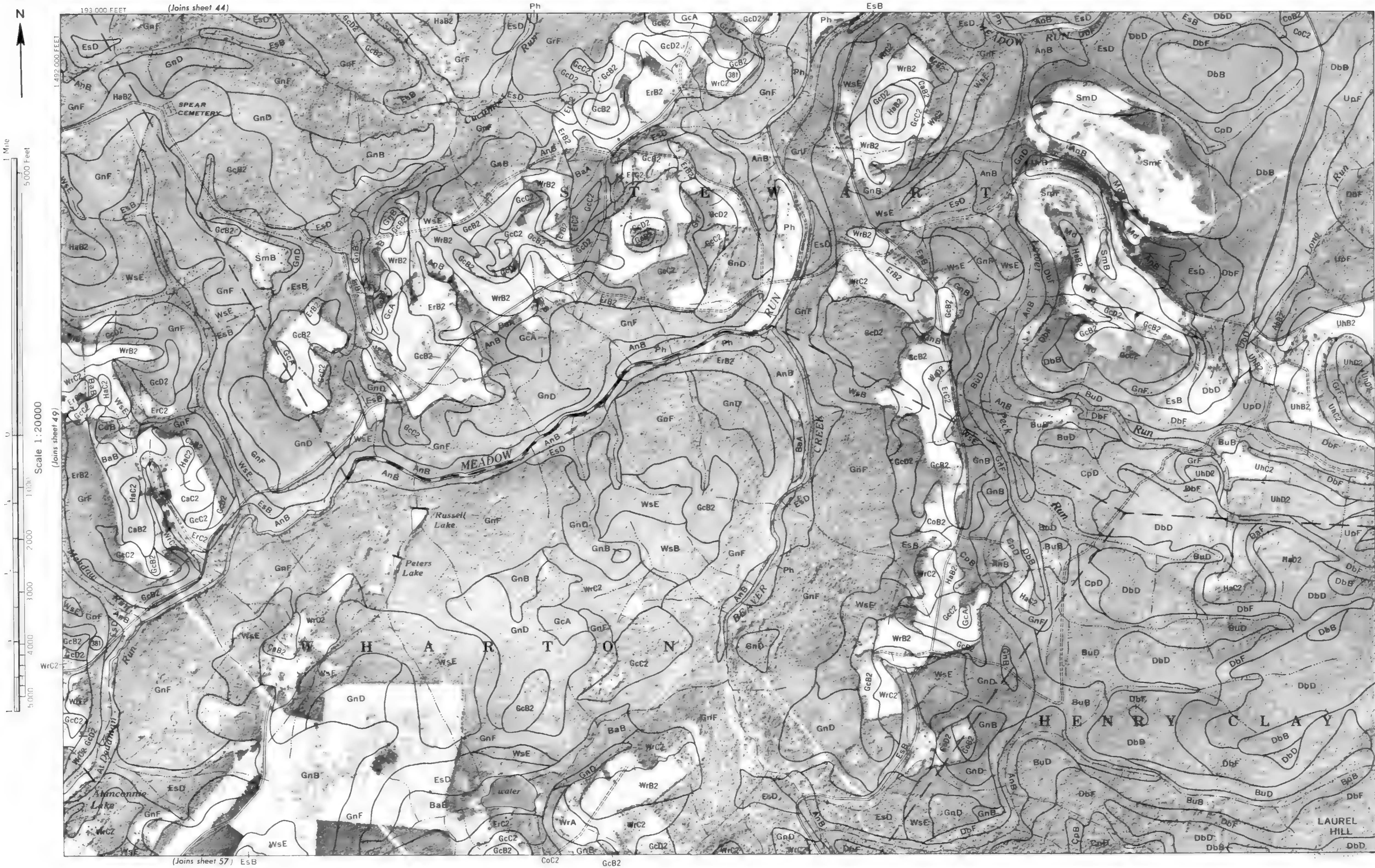
Photobase from 1967 aerial photographs Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

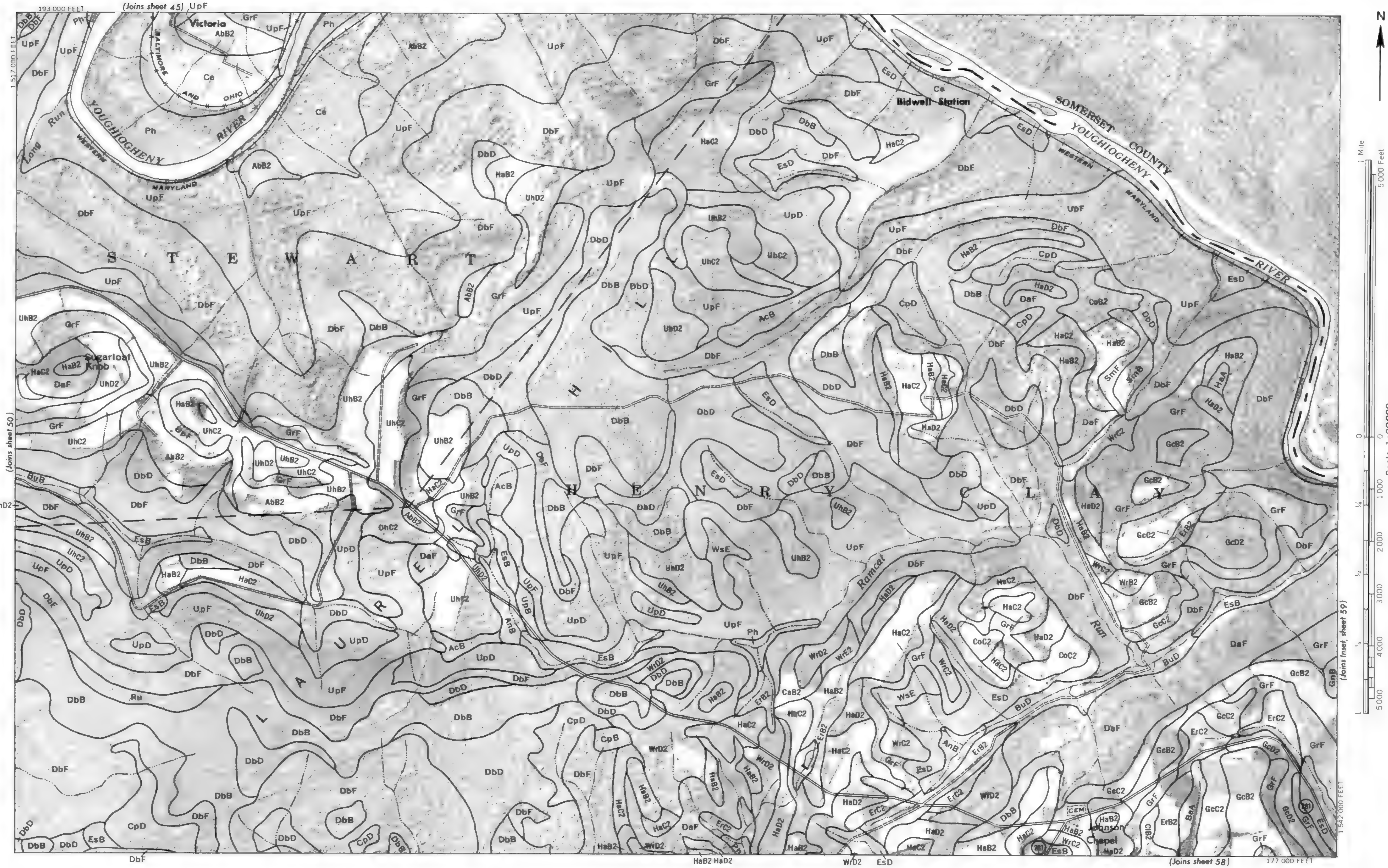


FAYETTE COUNTY, PENNSYLVANIA NO. 49

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum


N
193 000 FEET
1 492 000 FEET
(Joins sheet 44)
(Joins sheet 49)
(Joins sheet 51)
(Joins sheet 57)
Scale 1:20000
1 Mile
5000 Feet
SPEAR CEMETERY
MEADOW RUN
Cucumber Run
S T E W A R T
W H A R T O N
H E N R Y C L A Y
BEAVER CREEK
Russell Lake
Peters Lake
Mountain Lake
water
LAUREL HILL
Long Run
Lower Run
Rock Run

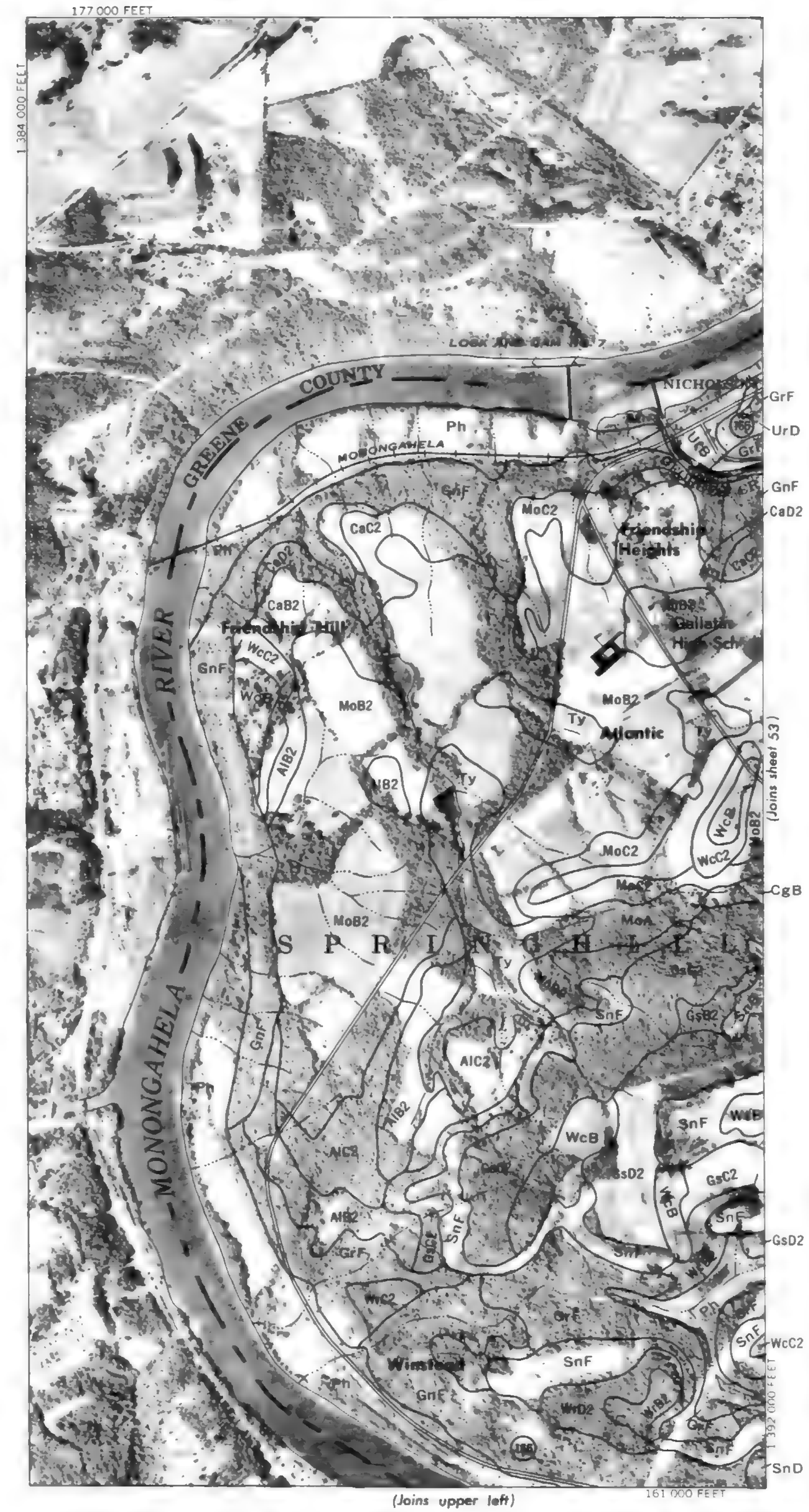


This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

FAYETTE COUNTY, PENNSYLVANIA NO. 51

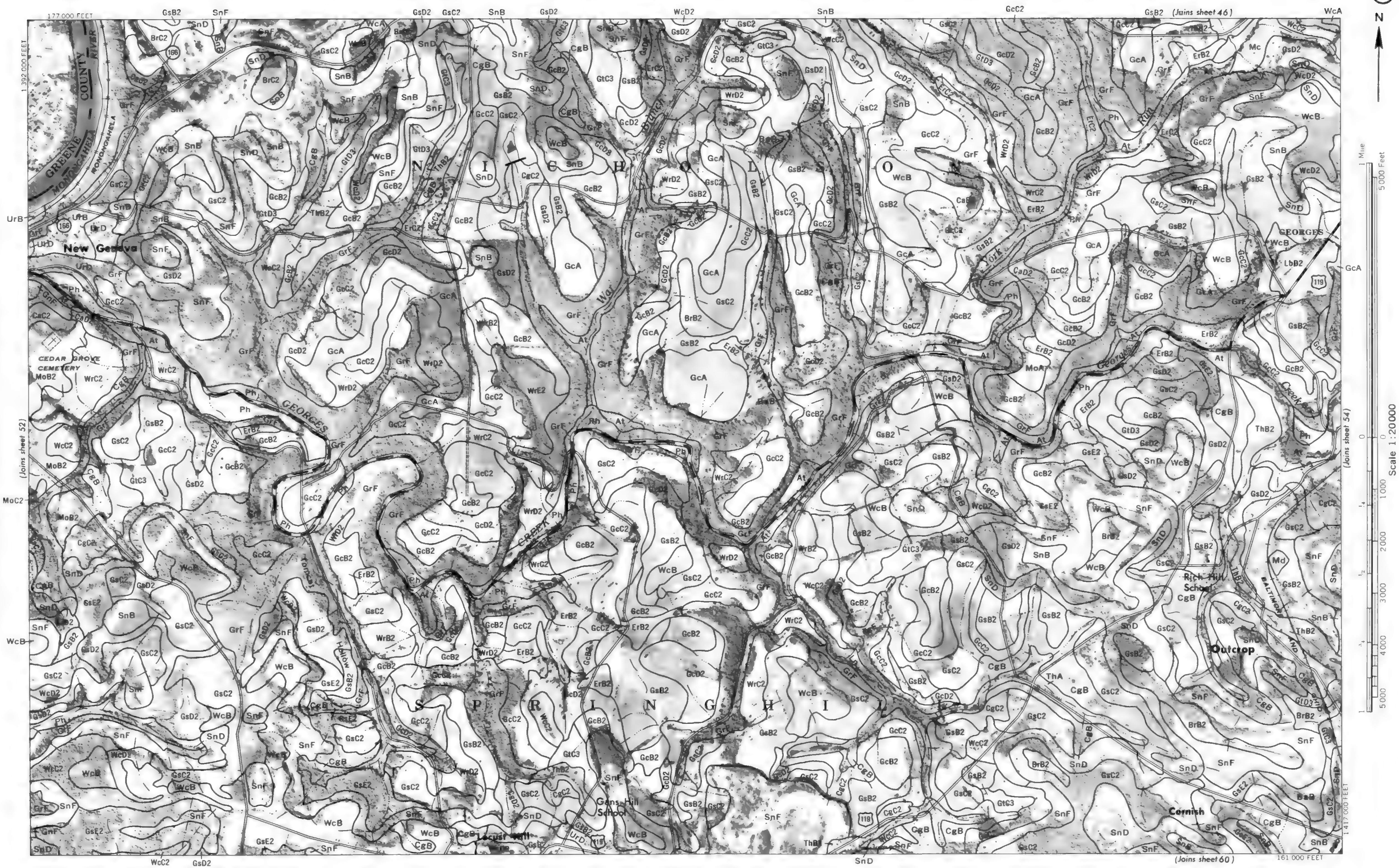
FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 52



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

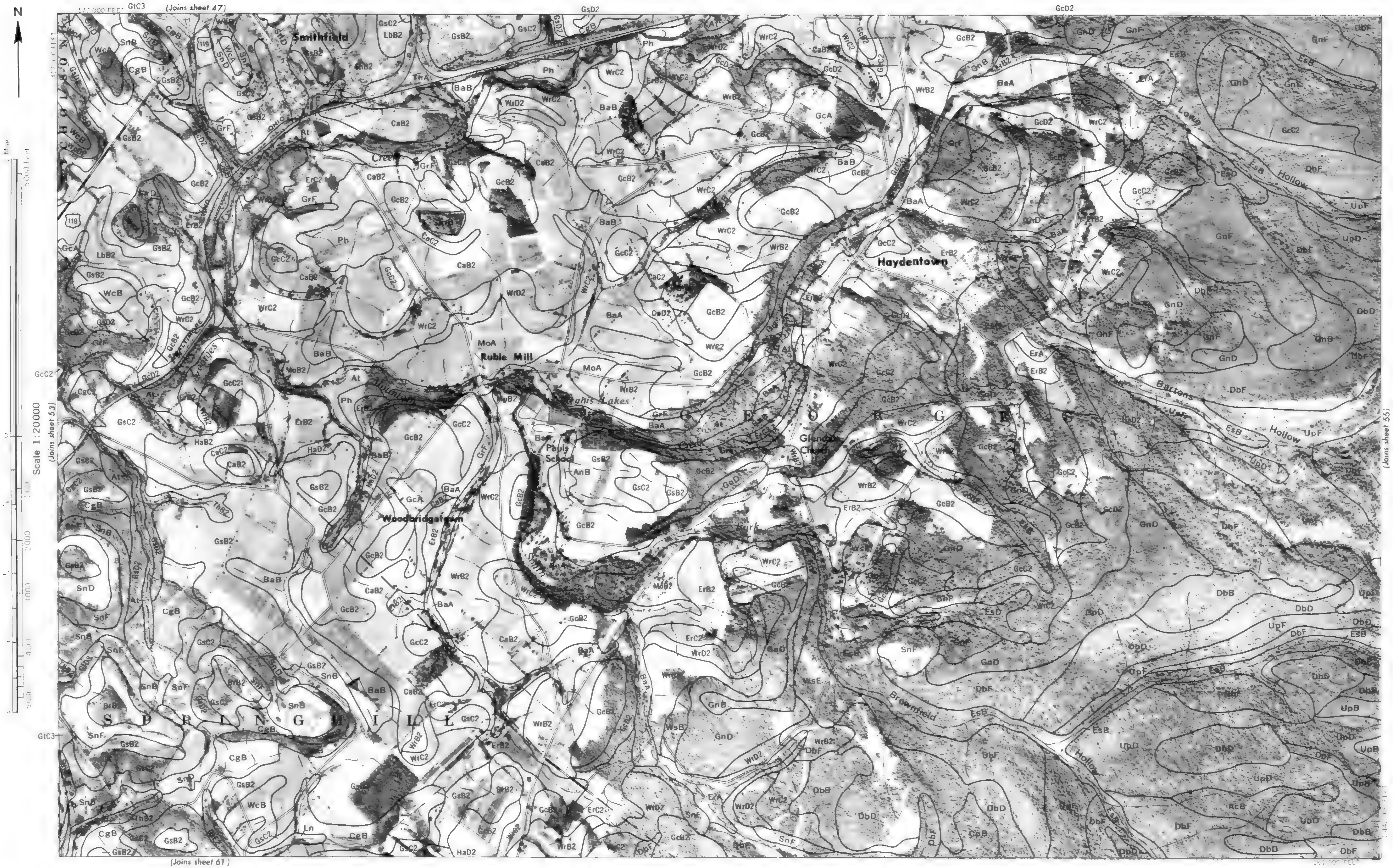
FAYETTE COUNTY, PENNSYLVANIA NO. 52



FAYETTE COUNTY, PENNSYLVANIA NO. 53

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

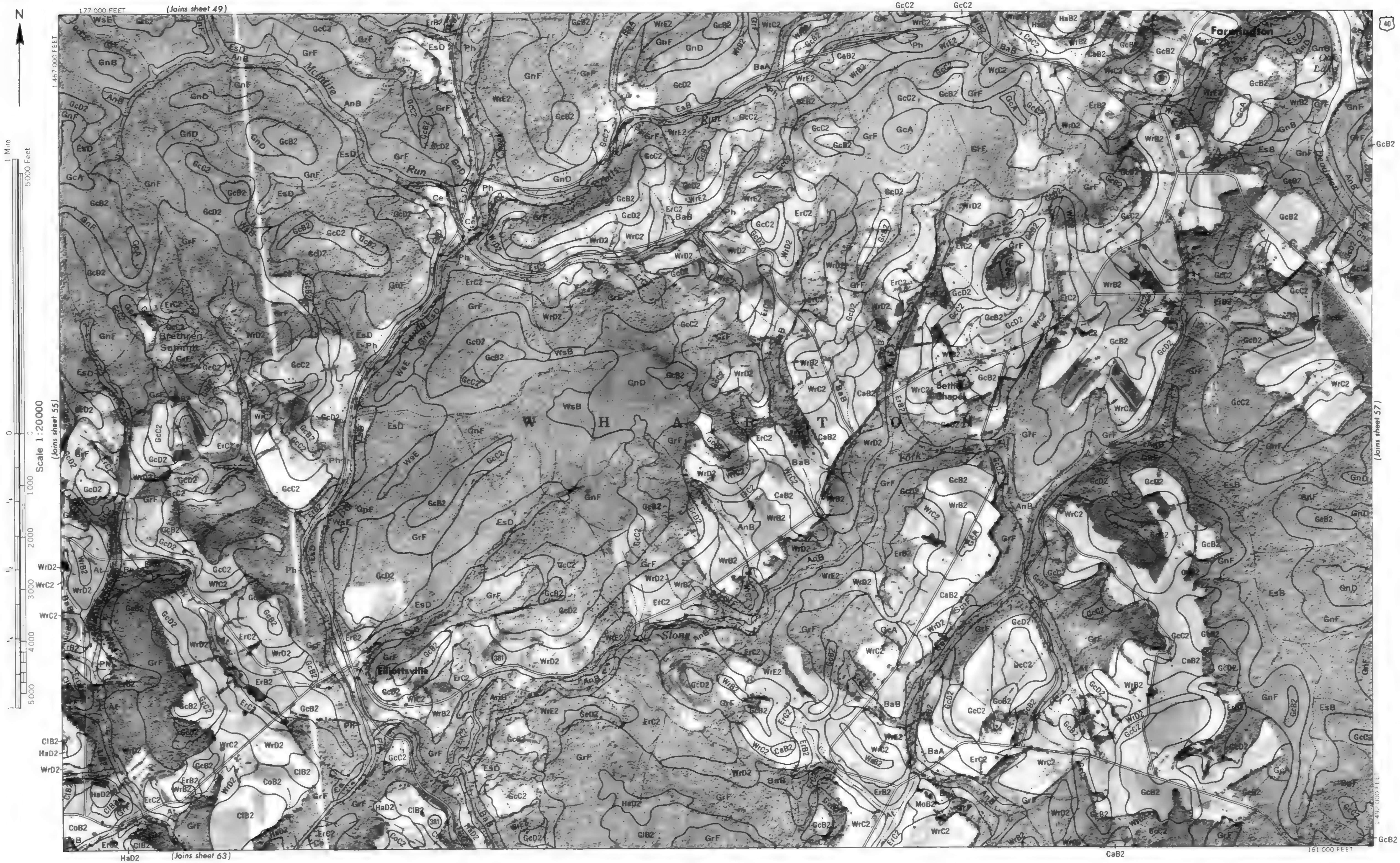
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.



FAYETTE COUNTY, PENNSYLVANIA NO. 54

FAYETTE COUNTY, PENNSYLVANIA NO. 55
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 56



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

FAYETTE COUNTY, PENNSYLVANIA NO. 57

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

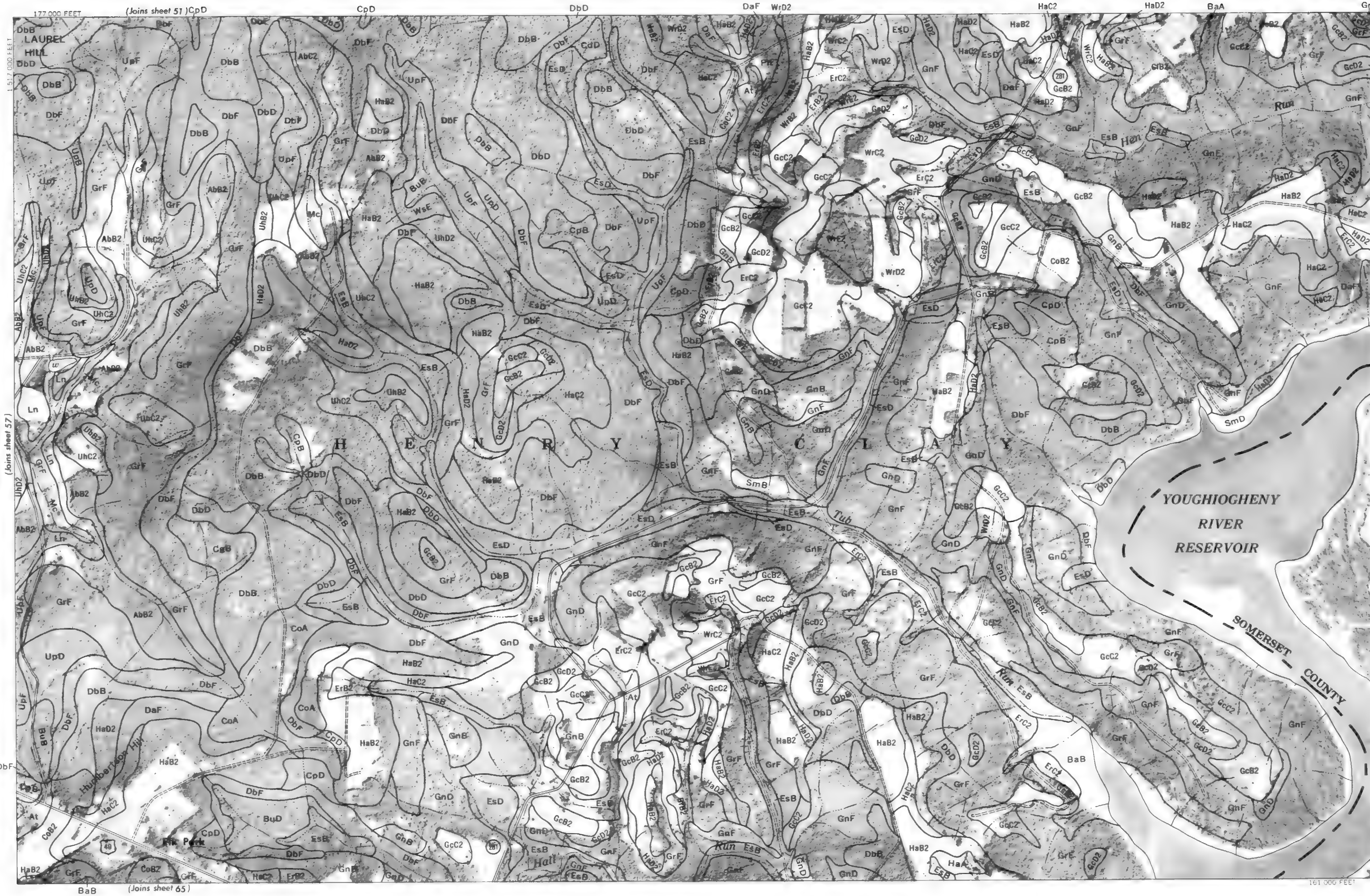
FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 58

N

Scale 1:20000

1 Mile

5000 Feet



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

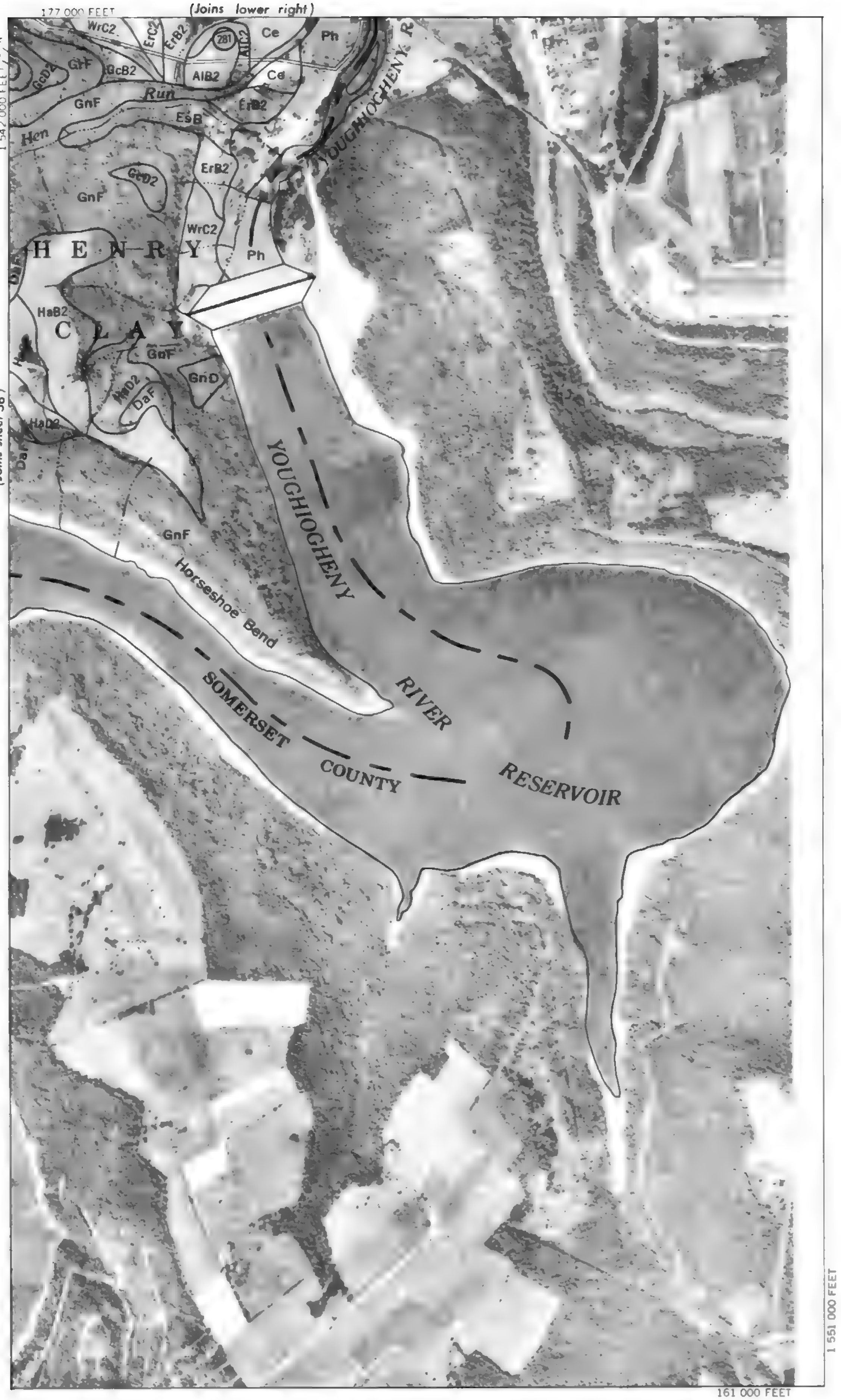
59

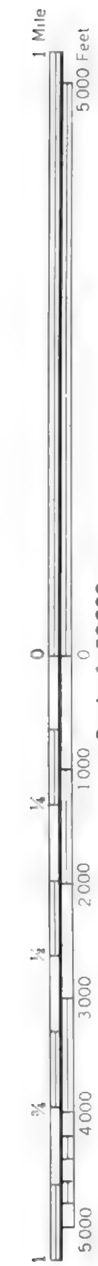
N

FAYETTE COUNTY, PENNSYLVANIA NO. 59

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.





FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 60

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

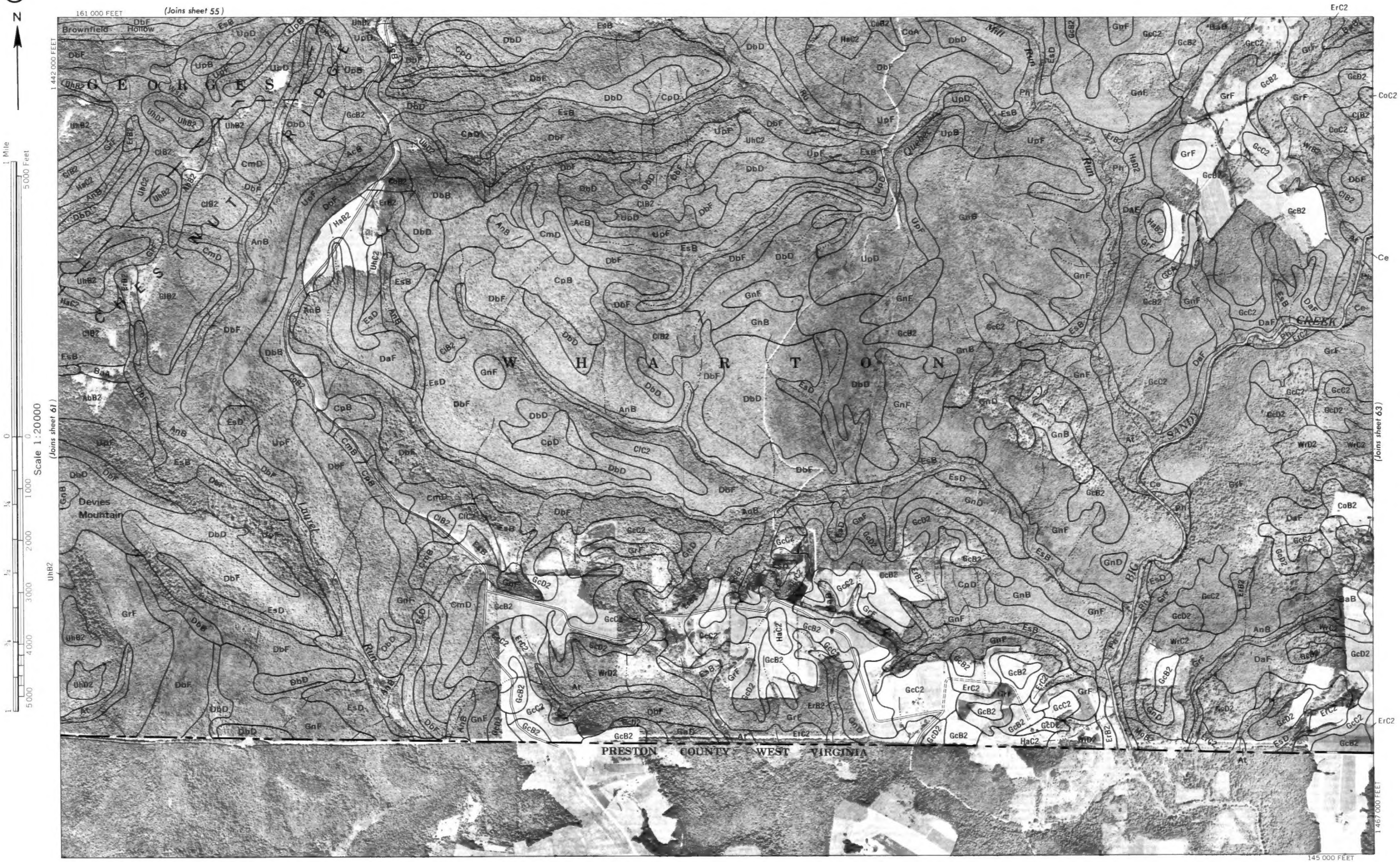
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

FAYETTE COUNTY, PENNSYLVANIA NO. 61

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 62



Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

FAYETTE COUNTY, PENNSYLVANIA NO. 62

FAYETTE COUNTY, PENNSYLVANIA NO. 63

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

FAYETTE COUNTY, PENNSYLVANIA — SHEET NUMBER 64

Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service; and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.

FAYETTE COUNTY, PENNSYLVANIA NO. 64

FAYETTE COUNTY, PENNSYLVANIA NO. 65
This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Pennsylvania State University, Agricultural Experiment Station and Agricultural Extension Service, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission.
Photobase from 1967 aerial photographs. Grid values based on Pennsylvania plane coordinate system, south zone. 1927 North American datum.